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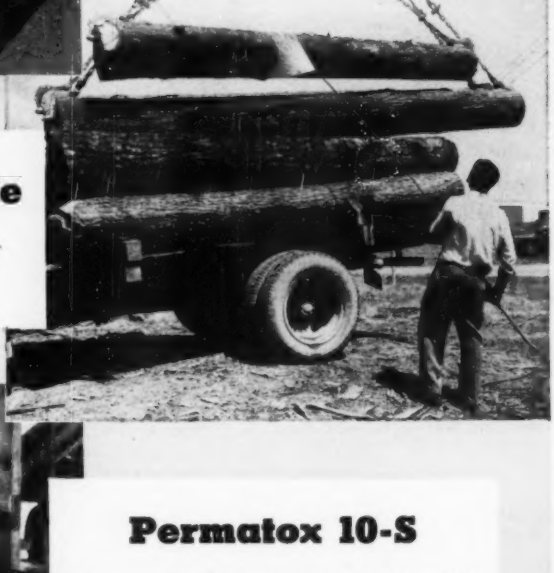

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Journal of Forestry

Official Organ of the Society of American Foresters

Sound Economics—The Basis of Sound Forestry

An Editorial

R. A. Colgan, Jr.

Executive vice president, National Lumber Manufacturers Association.

There is no dignity quite so impressive, and no independence quite so important, as living within your means.

WRAPPED UP in these few words written by Calvin Coolidge many years ago is a concept of sound economics equally applicable today to individuals, to the states, and to the nation. And if we are to have sound forestry, whether private or public, we must acknowledge the truth of the statement and be guided by it.

The best use of forest land is dictated by its *highest* economic use. When we adhere to this principle we are living within our means. If every acre of commercial forest land in the United States was intensively managed for maximum wood yield, the final result might be the production of wood material far in excess of our present or forseeable domestic needs. This would represent a colossal waste of land, labor, and capital that should have been expended on the production of needed materials and services.

Fortunately, the free play of economic forces largely prevents such waste so long as we maintain our private enterprise system. It is when government planning and control enter the picture that these economic forces are circumscribed or made inoperative. Some of our national planners (characterized by one unappreciative commentator as being "sometimes in error but never in doubt") appear to be convinced that they are better able to judge what our 150 million consumers want than can the consumers themselves.

Every forest landowner, whether large or small, decides for himself what the future market for his products is likely to be. On this basis he handles his property, occasionally changing his views as new factors enter into his calculations or as he gains added knowledge of current costs and returns. These several millions of owners' opinions are directly correlated with demands of the consumer and the prices consumers will offer.

I have seen estimates stating that if 100 million acres of our most productive forest land were intensively managed, they would supply all the wood material we will ever need. I have also seen statements implying that our future requirements justify intensive management of all our 461 million acres of commercial forest land. My reaction to these estimates is to say, "Let the future market as related to forest land productivity determine how much acreage should be intensively managed, and where this acreage should be located. The economic pattern of forestry, both as to intensity of management and geographical location, has been soundly developing over the years as the interplay of economic forces creates the proper financial environment."

We sometimes are assured that federal forest management creates more good for the public because of its multiple-use aspects, than does private forestry. I cannot agree categorically with this viewpoint. To illustrate, let's compare, hypothetically, a large tract of private forest land with an adjacent and similar tract of federal forest land. In the West, particularly, many such situations exist. The federal tract is managed for timber production, recreation, wildlife, and watershed protection. The private tract is managed for timber production.

We will assume that the federal forest has been under management for 40 years and that during recent years returns have increased to the point where they are equal to costs. This would mean that the forest was still in the red if all past costs plus interest were entered in the accumulated account. Since the forest was reserved from the original public domain its initial cost was negligible.

The private forest tract was acquired by purchase some 20 years ago. It would not have been acquired had the owners not believed it to be a profitable investment. This forest has, over the years, (1) paid annual ad valorem taxes, (2) paid interest on the original purchase price and subsequent operating costs, (3) returned a profit to the owners from forest management, also on which federal and state income taxes have been paid, (4) provided a habitat for wildlife, (5) provided watershed protection, and (6) provided a measure of recreational opportunity. This private forest, then, has supplied essentially the same benefits as the federal forests but with no cost to the taxpayer.

It may be true that this comparison is not typical. Nor am I here arguing for the complete abandonment of our federal forest system. But I do believe: (1) That our federal forests should be managed on a pay-as-you-go basis, and (2) that every encouragement should be given to the development of private forestry enterprise through minimum federal controls, taxes, and land acquisition—the

principal factors that stifle individual initiative.

I can see nothing wrong, for example, in the federal government selling outlying tracts of forest land to block up private forests if by so doing private sustained-yield forest management would be encouraged. And I have long felt that forest research might profitably encompass a system of *economic* demonstration forests to prove that forestry will pay or will not pay under varying local conditions. Such forests might aid the small forest landowner more than all the books and pamphlets on silviculture that have been written.

I believe that the time is rapidly approaching when private forestry should have less rather than more federal financial aid. Perhaps that time is at hand. Our tremendous national debt and enormous outlays for defense require that federal civilian expenditures be cut to the bone if our government is to remain solvent. Federal aids to private forestry are paid for by the taxpayer but he receives back only part of his taxes—the remainder goes to pay the federal costs of collecting the taxes and administering the aid. We know, too, that the government in parcelling out such money usually ties strings around the parcel which cannot be untied except by those who agree to use the money in the manner prescribed. The taxpayer and his state government should assume greater responsibilty in writing the prescription and in keeping at home such funds as are needed.

I wish that every forester in public employment had worked at one time or another in private enterprise, and that every privately employed forester had experienced a taste of public employment. The essentiality of such diversified experience is indicated by the simple fact that the principal product of our public forests is timber and the principal market for this product is the private wood-using industries. An understanding of public and private viewpoints would encourage more harmonious relations. Especially needed is a fuller appreciation by public foresters of the inexorable economic factors that control the actions of the private operator. Owning and operating for profit a piece of forest land will soon unravel the embroidery from any economic predilections one may have dreamed up during his period of non-proprietorship.

Years ago, when I shifted from public to private employment, I had little opportunity at first to put into practice what I had learned in forestry school. Railroad logging was the rule. Good cutting practices and fire protection were still only the dream of the evangelist. Competition and low prices forced my company and all others similarly situated to harvest quickly the greatest volume of logs, at the least cost, within easy reach of the railroad. There was little of my forestry knowledge that my company could use. But gradually the economic situation changed. Tractors and heavy-duty logging trucks were developed and railroads were displaced by logging roads and truck hauling. Better markets developed and prices of our products improved. The company began to take an interest in what I and other foresters had to offer. The company finally embraced forest management as a basic policy—but *economic considerations governed the decision.* The forester today can offer his professional knowledge with a great deal more assurance that it will be favorably considered.

The paramount problem the lumber industry has had and will always have is the maintenance of a satisfactory demand for its products. You will, no doubt, question this statement knowing that production of lumber last year was at its highest level in 20 years. But those of us who remember so well the 1930's, and who realize that the extraordinary demands of the past decade have resulted in large part from the artificial stimulation of war, government credit policies, and defense mobilization, must view the future with certain misgivings. These include a feeling that our government cannot indefinitely finance both a civilian and war economy at the present level; that the tax burden is approaching the limits of endurance; that the enormous federal debt hangs over our economy like a sword suspended only by a fast fraying thread of public confidence; and that increasingly our economic lives are being molded by government controls into the shape sculptured by the authoritarian's ideology. Perhaps some of this is inevitable in view of world conditions. But the sawmill operator or forest manager must have something more than the product made popular by Bourbon County, Kentucky to quiet his nerves as he views the future.

The National Lumber Manufacturers Association first established a conservation committee in 1910. Its present Committee on Forest Conservation is active in promoting every progressive movement in forestry it considers to be economically sound. On the association's Board of Directors are some of the nation's leaders in forestry practice. The assocciation backs vigorously, the KEEP GREEN, TREE FARM, and CASH CROPS programs of the American Forest Products Industries, Inc. The Association has long embraced the simple maxim that "Without trees there would be no lumber industry." We have always held sacred those basic economic principles that have made America great.

As a postscript, and chancing the fate of being labelled either a sentimentalist or a reactionary, I will again borrow from Calvin Coolidge a long-since forgotten quotation—one that I am resurrecting because it provides another philosophical guide-post for us foresters and for all others who will read it.

"Wealth comes from industry and from the hard experience of human toil. To dissipate it in waste and extravagance is disloyalty to humanity. This is by no means a doctrine of parsimony. Both men and nations should live in accordance with their means and devote their substance not only to productive industry, but to creation of the various forms of beauty and the pursuit of culture which give adornments to the art of life"

The Silver Jubilee of the Imperial Forestry Institute

H. G. Champion
Professor of forestry, Department of Forestry, Imperial Forestry Institute, University of Oxford, Oxford, England; Honorary Member, Society of American Foresters.

IN 1950 THE Society of American Foresters celebrated the 50th anniversary of its founding, and one naturally compares with interest the record of other forestry organizations at home and abroad. In doing so, attention may well light on two other events in forestry history with much more than local significance. One of these took place twenty-five years before the Society was founded, when in 1875 Schlich started the *Indian Forester* which was the first exclusively forestry journal in English. It is still appearing. The other occurred a little under twenty-five years after the Society's birth—the establishment of the Imperial Forestry Institute at Oxford, through the interest and cooperation of all parts of the British Empire. These two events may appear disconnected, but it was Schlich again who, in 1905, started the School of Forestry at Oxford University to which the new Institute was attached; it was one of his pupils who became the first director of the new development, and he lived to see it successfully launched.

A jubilee is the appropriate occasion for a review of past accomplishment and future policy. Therefore this article will examine briefly how far this venture of 1924 has fulfilled the objects for which it was set up, what its present position is, what it plans to do in the years ahead, and what it has contributed to forestry generally. The objectives in view must first be explained. In the words of Resolution No. 4 of the Second Empire Forestry Conference held in Canada in 1923, "This Conference strongly endorses the view held by the 1920 Conference that a Central Institution for postgraduate and specialist training in forestry, combined with research, is essential to the proper development of the forest resources of the Empire . . . and urges . . . to take immediate steps to inaugurate a Central Institution for forestry training and research at Oxford University."

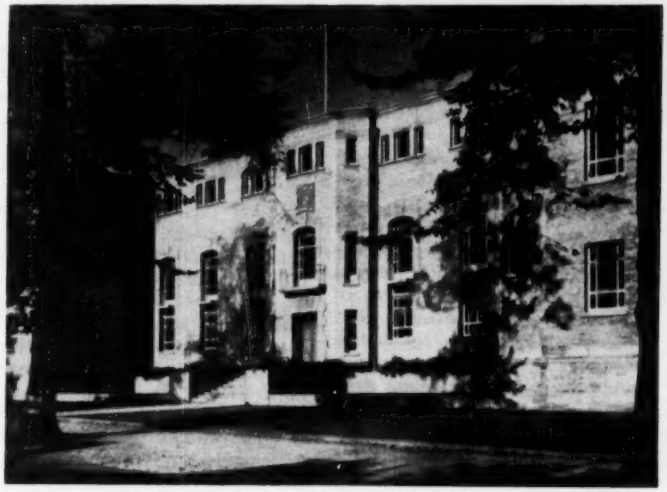

Photo by J. W. Thomas, A.R.P.S., Oxford. Courtesy the *Empire Forestry Review*.
Imperial Forestry Institute, Oxford

Among the lessons of the First World War had been the essential need of building up timber supplies in Britain and of developing the large resources existing in the tropical forests of the Colonies. India, with her 60-year record of forest development, was not a timber exporting country, and was "coming of age" when she would arrange her own affairs. The metropolitan organization for training and research needed reorientation to the changed requirements. Canada, being one of the chief timber countries of the world, was developing her own training and research centers, and Australia was following suit, but no other part of the Empire was in a position to follow their examples. There was general agreement that at least until they could do so, a center was needed at which joint effort could be concentrated to do what was most needed and practicable.

Institute Organized

It is not necessary to go into the reasons why the choice fell on Oxford, but the outstanding reputation of Schlich and his successor, Troup, had much to do with it. The new Institute was to share staff and buildings with the existing school and to be under the same head, Professor Troup. More staff was recruited to cover expertly, as far as was possible, the whole field of forestry—apart from timber research which would be dealt with by the contemplated Forest Products Research Laboratory (erected at Princes Risborough in 1927). Plans were made for an appropriate building, but unfortunately, owing to lack of funds, these plans could not be carried out. Makeshift arrangements had to suffice until recently when, after considerable modification, the long delayed project materialized with the opening of a new Institute by H. R. H. Princess Margaret on October 19, 1950.

Support Obtained

The Institute was financed mainly by grants from the Colonial Office and the U. K. Forestry Commission with contributions from some of the dominions and other Empire territories, but the greatest

difficulty was experienced in obtaining an adequate assured income. During the depression of the 1930's, drastic economies became unavoidable and several important lines of work had to be dropped or very severely curtailed with consequent reduction of staff.

From the start, the Institute received great support from the Colonial Office and colonies, and it was decided that all forestry graduates recruited to the Colonial Forest Service should spend a postgraduate year on a special course designed to meet the special conditions of the colonial forests—mainly tropical and in a very early stage of development. Nearly every officer has attended such a course after a period of duty in a colony.

As regards research, it was clear that most of the work would have to be done in the forests concerned, but that some of the most urgent needs such as the preparation of provisional forest floras and the systematic study and identification of timbers could well be done at the Institute, particularly if serving officers could cooperate. The Institute was also charged with the duty of training selected officers for field research and arranging advanced courses of study in any branch of forestry—including visits to other countries when required. Another service for which the need was at that time generally appreciated was for an information service drawing on the forest literature of the world and the experience of as many specialists as possible; a start was at once made on this work.

The Forestry Commission did not feel a need for any special arrangements on the educational side for its officers, but strengthened the organization by stationing some of the research staff at the Institute—a silviculturist, mycologist, and entomologist, the latter two working under the supervision of the Institute specialist in their fields.

As the burden of administrative work grew, it was decided to appoint a fulltime administrator for the Institute, although the professor remained the official head. J. N. Oliphant was director from 1934 until 1938 when a complete reorganization was made, the School and Institute being merged to form the University Department of Forestry under the professor.

Educational Work

Of the 220 officers of the Colonial Forest Service, almost every one has attended a postgraduate course, including the minority who had originally graduated at Oxford. The traditional link with the old India has been maintained since the Second World War, by an arrangement under which selected junior officers from India and Pakistan are deputed to a special course organized on lines similar to that run for the colonial officers. Several Australian foresters have done postgraduate work as Russell-Grimwade scholars. Not a few members of the forest services of New Zealand, South Africa, Southern Rhodesia, and the Sudan have received their training at the Institute and recently there have been one or two postgraduate students from Canada and the U.S.A.

This wide representation of countries by men who nearly all have some practical experience of forestry is most stimulating. Breadth of view is further ensured by contact with the foresters of continental countries during tours which are arranged in France and Switzerland (and formerly, also Germany, Austria, and Czechoslovakia) regularly, and periodically, in Sweden, Denmark, Norway, Belgium, and Holland. Study tours have also been arranged in Italy, Finland, Portugal, and even further afield.

Training in research is an important function, the success in which is to be judged more by the work done by ex-students when they get back to their forests, than that done while they are at the Institute.

Research Publications

Turning to the research work carried out by the Institute since its inception, including work done by those who were already on the School staff, the publications from the several sections provide some indication of what has been done. These have mostly appeared as Oxford Forestry Memoirs (22 issues to date) or Institute Papers (25 issues to date), in addition to which nearly 400 original papers have been published in technical journals such as *Empire Forestry Journal*, *Forestry*, *Quarterly Journal of Forestry*, and *Journal of Ecology*.

Other publications are the *Check Lists of Forest Trees and Shrubs*, which so far have been published for Uganda, Nyasaland, the Gold Coast, Ceylon, and Tanganyika Territory. The last mentioned is much the most comprehensive, dealing with 4,694 species; this work is making an important contribution towards the general *Flora of Tropical East Africa* which is at present under preparation at the Kew Herbarium. There is also a series entitled *Trees and Shrubs of the British Empire*, of which six issues have appeared. Numerous independent works have also been published by members of the staff.

The importance of an efficient referencing and abstracting service was recognized from the start, but difficulties were encountered in providing what was wanted, particularly in that lack of funds prevented the employment of adequate staff. The solution ultimately found was to separate this activity from the Institute itself and hand it over to a new forestry unit of the Imperial Agricultural Bureaux, another organization financed jointly by Commonwealth countries. The work is still based on the Institute library which aims at complete coverage of the forestry literature of all countries. The Forestry Bureau is accommodated in the Institute building, where it serves the teaching and research staff as well as the Commonwealth and the rest of the English speaking forestry world, particularly through the quarterly *Forestry Abstracts*.

The future? Well, the Institute is now for the first time well housed in a single new building, with far better facilities than it has ever enjoyed before. It has a keen staff of experienced men with adequate technical assistants.

Justifications For Forest Pruning In The Northeast[1]

David B. Cook
Supervising forester, New York State Conservation Dept., Albany.

To FORESTERS, pruning represents a method of speeding up the development of that smooth, cylindrical bole which is the ideal of timber tree form. Generally, it has been applied only to those stems destined to be grown to large size for sawlogs. But, as management becomes more intensive, this may prove to be too limited an objective. There are many sound reasons—pathological and administrative as well as economic—why we should prune. But because pruning represents a heavy outlay of capital that cannot be recaptured for a considerable time, it must be carefully planned and skillfully executed, lest we commit ourselves to an unprofitable venture.

In the Northeast, pruning has most often been applied to young coniferous stands, either natural or man-made; most frequently has it been advocated for pine, occasionally for spruce, rarely for other conifers, almost never for forest-grown hardwoods.

Despite long practice and much study, there is today wide professional disagreement on both the merits and the methods of pruning. Among any dozen foresters can be found advocates of all degrees of intensity, from "prune everything" to "prune nothing." Somewhere between these extremes lies a proper course, but what it should be depends on economic, technical, and social factors which are not always well understood or fairly assessed.

Can We Afford Not to Prune

The problem is not so much whether we can afford to prune as it is whether we can afford NOT to. Over the next half century, our cut-over and untended forests will grow myriads of limby trees from which can be sawn vast quantities of No. 3 and No. 4 Common, relatively little Selects or FAS, and this at little cost except for basic protection. If our managed forests yield nothing better, our silvicultural efforts will have, in some part at least, failed of their proper objective, which should be to grow *quality* as well as *volume*. There seems little point in spending good money cultivating our forests if the end products are to be only boxboards or knotty pulpwood.

Dead limbs cause knots, which are both the most frequent and the most serious defects in softwood lumber and also in some hardwoods. With them are often associated pitch pockets, rot, and stain. There is little the forester can do about defects in lumber such as wormholes or birdpeck, checks, or wane. But he can prune off the limbs that cause knots.

In the untended forests of the Northeast, the production of clear lumber does not begin until rather late in the life of the tree. Boyce (*3*) says, "With most conifers, clear lumber cannot be produced in the short rotations necessitated by commercial forestry." Speaking specifically of second-growth white pine, Hawley and Clapp (*6*) state, "Under natural conditions the dead branches remain on the trees nearly to the ground for at least 60 to 80 years." Only in very crowded stands will red spruce or hemlock develop a limb-free lower bole in less than half a century; in stands of low density, they may never grow any clear wood at all. In fully stocked, even-aged hardwood forests, the less tolerant species usually clear their lower boles fairly well by age 40. With the more tolerant species and with lessened density, it takes longer. Even if, by skillful manipulation of stand density, we could cut the time for natural pruning substantially, it would still be too long for the requirements of intensive forestry. Only by artificial pruning can we hope to secure a goodly proportion of knot-free lumber from managed forests.

Crop Tree Pruning

The most commonly advocated system calls for the pruning of a relatively few (100 to 300) crop trees per acre (*4, 6*) with intent to produce large, top-quality butt logs from which can be sawn a high proportion of the upper grades of lumber. All other trees are left unpruned, to die naturally or to be cut for less exacting uses. This is a sawlog forester's concept. In a region dominated by production for lumber, it is perfectly sound and logical but, where a wider variety of markets is available, it is inadequate. And, at present, the crop-tree system is properly applicable to only a few species.

From an economic viewpoint, we must justify crop-tree pruning on the grounds that it will produce, during a relatively short rotation, a better proportion of upper grades than would be grown naturally, and that the price spread between upper and lower grades will more than offset the costs of pruning. This is particularly true for white pine, where the upper grades are in brisk demand at excellent prices, while lower grades move at much lower figures. Just pre-Korea, white pine 4/4, 1 by 8, D4S, D Selects and better were quoted f.o.b. mills in New England at $185 to $205; the same size in No. 3 Common at $93 to $100 (*1*). But the *lumber value* ratio of 2 to 1 between D Selects and No. 3 Common tells only part of the story. Since good trees are cheaper to log and to mill than are poor ones, the ratio of *stumpage value* should be even more favorable to the best trees. And stumpage value is what counts to the forester. Heiberg (*7*) has shown "that two-thirds of the value of the entire [white pine] tree was found in the first 16-foot log, or in only one-third of the total cubic foot volume." When we consider that artificial pruning will be applied almost exclusively to this important butt log, the possibilities of increasing the value of white

[1]Paper presented at a meeting of the Division of Silviculture, Society of American Foresters, Washington, D. C. December 15, 1950.

pine stumpage by crop tree pruning will be apparent.

In the Northeast, red pine lumber is commonly mixed with and sold as white pine, apparently without discrimination. The Standard Grading Rules (*2*) cover both northern white pine and Norway (red) pine. It seems likely that, if and when separately available in quantity, the upper grades of red pine will bring prices comparable with those of white pine.

With red spruce, the situation is obscured by heavy and increasing use for pulpwood, where knots are of less importance than in lumber. But, even though they can successfully use knotty wood, the pulpmill men appreciate the value of better grade material. In areas *outside* the influence of the pulpwood market, planted Norway and white spruce will doubtless go into sawlogs. When a commercial supply is available, a satisfactory price differential between grades may well develop.

Hemlock, the best framing timber in the Northeast, has seldom been available in anything but mill run. Considering the uses to which the lumber is commonly put—framing, sheathing, and roof boards—it is doubtful if clear lumber would bring a price premium.

Pruning of Hardwoods

Among hardwoods, the situation is critical. The demand for quality lumber is strong and prices are high, while the lower grades are a drug on the market. This is particularly true of white ash, basswood, black cherry, yellow birch, and hard maple, where the upper grades bring fancy prices. In the recent past, 4/4 maple has sold for $160 to $175, while No. 2 Common was priced at $48 to $55 and No. 3 Common at $28 to $35 (*1*). The spread here is even greater than with white pine. Prices quoted for No. 2 and No. 3 Common leave little if anything for stumpage.

Clear butt logs with small knotty cores will be admirably suited for veneer, a use which is expanding rapidly and which can satisfactorily use a wide range of woods. The knotty center would be waste anyway, so the recovery of quality material is even greater than with sawn lumber. Since veneer logs command top prices, their deliberate production would seem to be worthwhile. Pruning, so timed as to produce the smallest feasible core and applied to at least a minimum number of trees, is the only economic way to produce quality saw and veneer logs in many species.

There are sound arguments for pruning more than the minimum of 100 to 300 crop trees per acre. Perhaps the most compelling reason is the fallibility of human judgment. It is unreasonable to expect the forester to select accurately at stand age 20, those trees which will survive fungus and insect attacks, wind, lightning, and other hazards for 40 to 60 years and remain thrifty and dominant. Some of us would prefer to start with 500 trees at first pruning, and drop down to 300 only in the final stage. The added cost might well be considered as an insurance premium.

Pruning for Specific Products

That portion of a tree's bole which is below the live crown tends to assume the form of a cylinder; this happens whether the lower limbs die naturally or are removed artificially. Where poles or piling are desired, pruning will develop stems best suited to such use in the shortest time, and will produce the greatest scale for a given amount of wood volume. It seems likely that red pine, because of its straightness and rapid growth, will be favored for such products. Because of their fine form, the exotic larches—European and Japanese—may also be used for poles and piling. On smooth, even stems, the mechanical peelers used on poles will waste less wood, consume less power, and do a faster and more uniform job.

Whenever the product is to be hand-peeled, the smooth bark which develops after pruning will make the tree much cheaper to process. Bark can be spudded off easier, quicker, and cleaner from knot-free boles. On limby stems, it is difficult to get a clean peel in the axils of branches, particularly dead ones. Toward the end of the growing season, the bark begins to stick first in V-shaped patches below branches. Holes made when limbs are lopped off cause the strips or sheets of bark to break, increasing the labor of peeling. And, unless extra care is taken, branches will be cut off flush with the *bark* rather than the *wood*, leaving stubs which must be trimmed off later.

Removal of the bark is an essential prelude to almost any commercial preservative treatment, whether the piece be a fence-post or a Class I pole. Increasingly, Northeastern pulp mills are demanding that both hardwood and softwood species be peeled. Most pulpwood will be cut from trees 6 inches d.b.h. and up, as a product from early and intermediate thinnings. Considering that the sap-peeling season is short at best, pruned trees will be quicker and cheaper to peel, permitting greater production and a more profitable operation. It would seem that, where intermediate cuttings can be sold for poles, piling, or treated material, or where the wood is to go for peeled pulpwood, it might prove profitable to prune all trees which can be expected to live and grow to minimum merchantable size.

Pruning Aids Logging

Aside from the improvement of the product, there are other good reasons for pruning. Every logger that comes into a forest will, to get himself safe and adequate working space, take off a good many low limbs. It will be rough treatment, with little heed for the welfare of the tree. A quick axe stroke or two will cut off the branch, leaving a stub that will, if and when overgrown, make a long, dead knot. Whether we are working in an even-aged stand or a several-storied forest, we must expect such informal pruning. It might be much better to remove properly the low limbs—say up to 10 feet—from all trees that can be expected to grow to useable size. Such pruning would help provide adequate overhead clearance for cutters and skidders, and might well pay for

itself in a decreased accident hazard.

Coniferous plantations ordinarily close during their second decade, after which they are almost impenetrable. Such stands are difficult for the forester to inspect; only the birds really know what goes on inside. One good look into this impenetrable mass of interlocked dead branches frightens away most would-be operators, confirms them in the belief that plantations cannot be thinned at any reasonable cost. And only along the edges will wildlife make adequate use of the superior shelter which they provide. Crop-tree pruning, if amplified by an occasional cleared lane, facilitates inspection and increases availability to wildlife.

Silvicultural and Protection Aspects

In silvicultural systems based on partial cutting, such as are now enjoying widespread popularity, the larger reproduction often suffers from overhead interference by the crowns of taller trees. This is especially true of tolerant species with deep, wide crowns, such as hemlock develops when in mixture with thin-foliaged hardwoods. When circumstance does not permit the removal of such wolfish individuals, pruning sufficient to free the tops of promising reproduction may be in order.

Where plantations are composed of two or more species, the one with the most rapid juvenile growth tends to overtop and suppress the others. Judicious pruning of the dominant will, in some combinations, permit the other species to develop more satisfactorily.

Pruning, especially when done in two or three stages, gets limbs off the tree and into contact with the ground either before or soon after they have died. This promotes decay and reduces the amount of highly inflammable fuel in the zone just above the ground. Early pruning, especially when numerous noncrop trees are included, will reduce the amount of slash from early thinings. Such slash is not only a fire hazard, but also a great encumbrance to logging. Its addition to the litter builds soil fertility and improves the environment for small mammals, whose presence in abundance may act as an important check on certain forest insect pests. Pruning of scattered conifers in hardwood stands may reduce the tendency to accumulate patches of raw humus under their crowns.

White pine blister rust often becomes established on lower limbs of small trees and the cankers spread slowly along the branch and into the trunk *Tympanis* canker of red pine usually infects through persistent dead branches (*3*). *Cytospora*, formerly considered only a weak parasite, has recently become locally epidemic, killing Norway spruce (*5*); it usually starts as a branch canker. Timely removal of infected limbs in the course of a pruning operation would minimize the effects of these three canker diseases.

In many rural communities, seasonal under-employment is a serious social problem. Since pruning can and perhaps should be done at a season when farm work is slack, it might well offer opportunity for part-time work. Where timberland owners must maintain large crews for summer operations, pruning provides useful work for men who might otherwise be unemployed in winter. It has the added advantages of requiring little equipment, no particular skill, and a relatively large amount of work per acre.

Quality timber is cheaper and easier to exploit and to manufacture, and yields more usable product and less waste. In times of national emergency, when demand is pressing and manpower scarce, good timber is an invaluable national resource.

In preparing any tree for commercial use, the branches must first be removed. The cost of pruning will, at least in part, be offset by a saving in the cost of lopping at the time of harvest. The difference in cost between taking green or newly-dead limbs off the first log of a standing tree with a pruning saw, and taking those same limbs, dead and dry, off that same stem with an axe, after it has been felled, may not be very great.

Because of the many economic and social gains, both direct and indirect, that can be achieved through proper use of the pruning saw, foresters would do well to give this phase of timber improvement most careful consideration, and apply it more widely in our intensively managed forest.

If we grow timber, let's grow GOOD timber!

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Stem-Crown Diameter Relations in Southern Pine

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THE POSSIBILITIES of direct gross volume determinations from aerial photographs have intrigued foresters during the past several years. Results of various investigations by the forest experiment stations and the Harvard Forest have rather definitely established that in certain types of forest stands volume is well correlated with measurable variables. Thus, although the volume computation must be an indirect one, when there is close correlation between tree volume and those factors which may be studied and measured stereoscopically, the gross volume may be determined rather precisely. Limitations and advantages of aerial photo volume determinations, as well as the general methods used, are thoroughly discussed by Spurr (*8*). During the past four years the trend toward use of aerial photographs has undergone tremendous development in the southern pine region. In the State of Louisiana there are at least three large paper or lumber companies who have their own recent photographic coverage and numerous other companies who are using Production and Marketing Administration or other governmental photographs of varying age. In view of this increased usage of aerial photography for forestry purposes a project was set up by the Louisiana State University School of Forestry to study volume correlations and to develop timber volume tables for use with aerial photographs. The first correlation to be investigated was that of tree diameter (breast high) with visible crown diameter, and it is the results of that phase of the study which this paper primarily presents.

Methods of Study

Half-acre square plots were established in 45 southern pine sawlog-size stands of varying age, density, and composition throughout southeastern Louisiana and extreme southwestern Mississippi. The plot location was generally randomized within the stand, with the limiting provision that space be available for a square half-acre plot on which timber size, density, and composition remained fairly constant. On these plots each tree with a crown diameter of 4 feet or larger, visible from directly above, was measured and tallied. Measurements included crown diameter, stem diameter at breast height, form class, merchantable length, total visible height, total height, and crown class.

In determining crown widths or diameters from the ground, rather than using the conventional method of measuring four radii, a procedure was developed whereby the crown diameter was always measured east and west and included only that portion of the main crown which would resolve itself on an aerial photograph. This method was found to give consistently accurate results when it was checked by measuring certain tree crowns on the ground and then on the photograph. Photo measurements of crown diameters were also made in an east-west direction using a shadow length measuring scale or crown wedge.

The total visible height was measured to a point where the tree crown narrowed to 3 feet in diameter, this being about the smallest size object that will resolve on a 1/20,000 photograph (*2, 8*). Standard mensurational techniques were employed for the other measurements described.

Of the 45 plots, 38 were in stands of predominately loblolly pine, either in pure stands or with mixtures of shortleaf, spruce, slash, or longleaf pines, and miscellaneous hardwoods. All the stands sampled were second growth and ranged in age from 30 to 70 years.

Results

A strong correlation was found between crown diameter and stem diameter (breast high) as might be anticipated from similar results by other investigators working with different species in different regions. The relation of d.b.h. to crown diameter was slightly curvilinear, but approached a straight line in form.

The 38 predominately loblolly pine plots (2,501 trees) were analyzed separately and the following linear regression equation of stem diameter on crown diameter was derived:

db.h. (inches) = 4.66 + 0.55 crown diameter (feet).

This straight line (Fig. 1) well expresses the relation of the two variables through the small and medium crown diameters from 5 to 20 feet. Above 20 feet the data appear to indicate a more gradual slope until d.b.h. increases but slightly with larger crown diameters. Some of this tendency may undoubtedly be due to insufficient data in the larger crown and tree diameters. However, this same lack of data is probably the result of, and an indication of the maximum size to which present day second-growth stands are permitted to grow. A similar flattening in the stem diameter curve has been noted by other observers in the case of both hardwood and softwood species (*8*). The correlation coefficient (r) of the linear regression between d.b.h. and crown diameter was +0.873 or very high positive correlation.

Also analyzed was the effect of stand density upon the relation of stem diameter and crown diameter. The stands sampled in this study varied from 65 to 260 trees per acre with most of the areas composed of 80 to 120 trees per acre. Figure 2 shows the wide scattering of points occurring when the d.b.h. for a 15-foot crown diameter was plotted over number of trees per acre on each of the 38 plots. The straight line fitted to these data has the equation:

d.b.h. (inches) = 14.28 — 0.011 trees per acre.

The correlation coefficient between stem diameter and trees per acre was —0.43, denoting rather poor

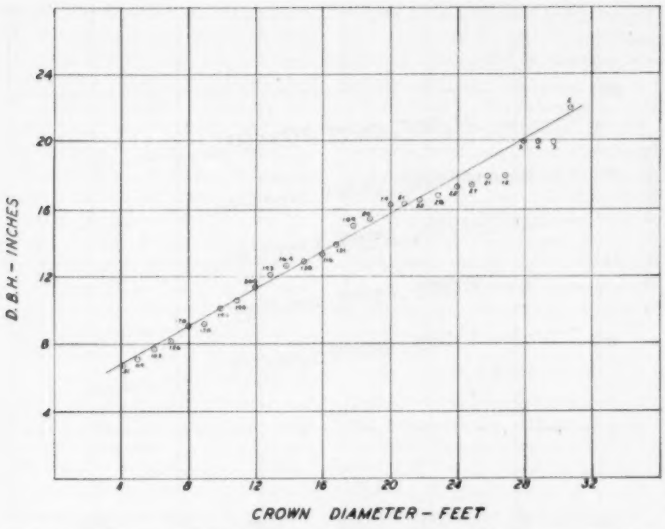

Fig. 1.—Relation of stem diameter to crown diameter for loblolly pine. Based on 2,491 trees. Standard error of estimate, 1.6 inches.

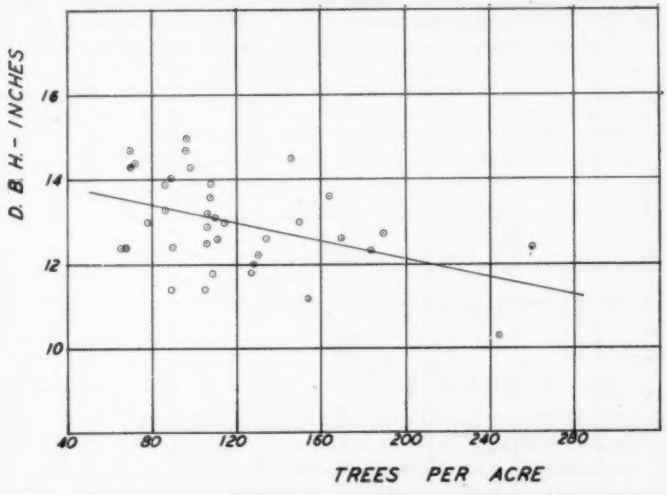

Fig. 2.—Effect of number of trees per acre on the stem diameter for a 15-foot crown diameter based on 38 plots in loblolly pine. Correlation coefficient 0.43.

correlation. No other possible curve form seems to be indicated by the plotted points so the lack of correlation cannot be attributed to the linear regression. In Figure 3 are presented the curves of stem diameter on trees per acre for crown diameters from 5 to 25 feet. The trend was similar throughout and it was found that the correlation was equally poor in all cases.

A straight line (Fig. 4) was fitted to the data from the seven plots in longleaf pine stands. The equation of this regression of stem diameter on crown diameter was:

D.b.h (inches) = 2.39 + 0.62 crown diameter (feet). The correlation coefficient in this instance was 0.891, again indicating a high degree of correlation between stem and crown diameters as was found with the loblolly pine plots. Although based on only 618 trees the relation seems strong enough to permit fairly consistent stem diameter determination. However, the age range covered by these seven plots restricts the validity of the estimate somewhat. Of the plots, six were in stands between 25 and 35 years of age and the seventh was in a residual stand with trees between 90 and 120 years old.

Discussion

The high degree of correlation between stem and crown diameters in both loblolly and longleaf pines appears to lend much promise to the possible determination of gross tree volumes through aerial photographic interpretation. Spurr (8) reports that crown diameters may be consistently classified into 3-foot classes on aerial photographs at a scale of 1/15,840, or 5-foot classes at 1/20,000, and personal tests on the plots covered by this study have verified this conclusion. Since d.b.h. is so closely correlated with crown diameter it follows that trees may be classified into 2- or 3-inch diameter classes on aerial photographs; about the same accuracy as used in much ground cruising. With tree diameter determined to a reasonable accuracy it may be concluded that only the lesser variables affecting tree volume, height, and form, remain to be considered.

Tree heights may be measured directly on aerial photographs by a number of methods. Personal experience to date seems to indicate that the simple parallax wedge is best adapted for use with southern pine. The factor of tree form or taper cannot be directly measured on aerial photographs and the possibility of its indirect determination needs further study. So far in this study, preliminary volume tables for sawlog stands have been derived for both loblolly and longleaf pines, using crown diameter, total visible height, and an average Girard form class. However, these tables will require analysis of the effect of tree form, as well as further ground checking before pub-

lication as an experiment station report.

There are also practical applications of the crown diameter-stem diameter ratio for purposes other than volume determination. It is readily apparent that if stem diameter may be determined from the aerial photograph the basal area may be easily computed. By adequate sampling procedures the basal area per acre may be determined for any stand. These basal areas in turn may be used as expressions of stand density. The relation of d.b.h. to crown diameter is also of value in stand mapping where size classes are being differentiated. A range of crown diameters may be computed and set up to indicate large saw timber, small saw timber, poles and pulp, etc., or to indicate whatever stem diameter classes it is desired to use in mapping.

The effect of stand density, in terms of number of trees per acre, on the stem diameter-crown diameter ratio appears to be hardly worthy of consideration. When the stem diameter for a given crown diameter varies only 2 inches between stands of 65 to 260 trees per acre it seems logical to conclude that the variation in the majority of typical saw timber stands would be too negligible to consider. Therefore it is concluded that a given crown diameter will, for practical purposes, be accompanied by a given stem diameter.

Some explanation of this constant relation between d.b.h. and crown diameter may be found in the fact that all stands sampled were of sawlog size and 30 years of age or older. Matthews (*6*) in discussing his spacing figure concludes that the ratio between diameter of crown and diameter of stem changes somewhat during the early life of a stand but should remain constant once the basal area of a stand is stabilized. Chapman (*1*) and Meyer (*7*) working with data on loblolly pine from Arkansas and Louisiana have found that basal area reaches equilibrium at an early point in the life of the stand. This may be as early as 20 years if all trees 2 inches and over in diameter are included, or at 30 to 40 years if the minimum diameter is raised to 4 inches. It may thus be concluded that the stands sampled in this study had nearly all reached basal area stabilization age which resulted in practically constant stem-crown diameter relations.

The conclusion that a given crown diameter will result in a nearly constant d.b.h. appears to

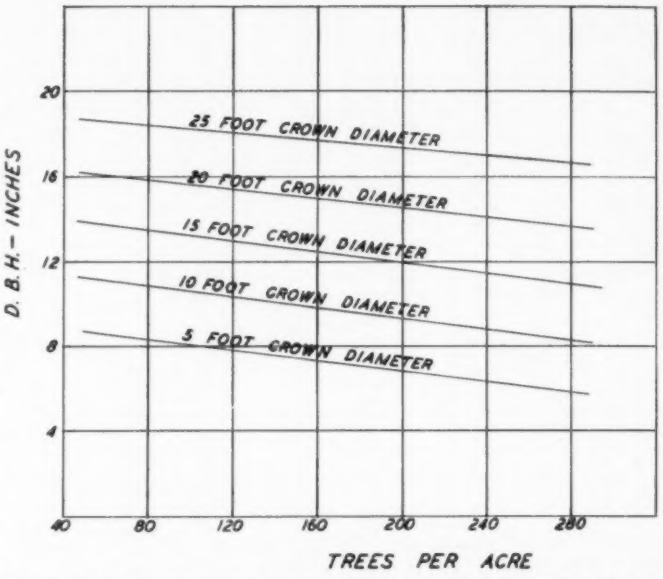

Fig. 3.—Stem diameter-crown diameter relations as affected by number of trees per acre. Based on 38 loblolly pine plots.

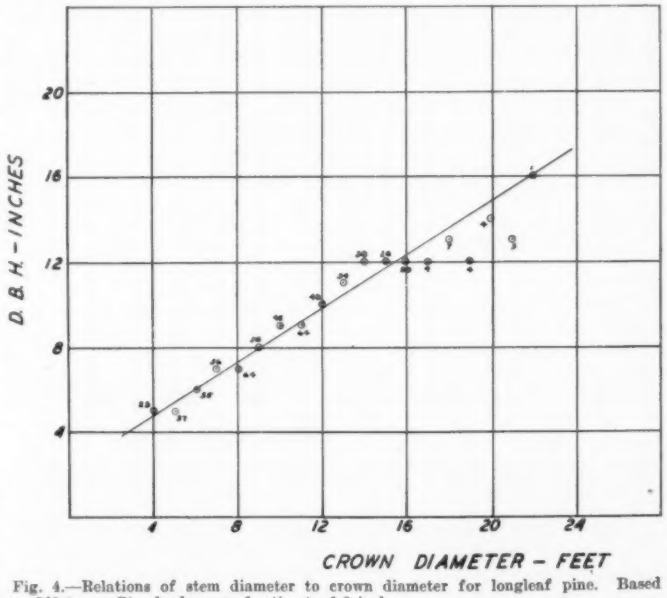

Fig. 4.—Relations of stem diameter to crown diameter for longleaf pine. Based on 568 trees. Standard error of estimate, 1.2 inches.

have some silvicultural importance. If, after thinning, a certain amount of space is left into which a tree crown may expand, it follows that the tree diameter eventually resulting may be predicted, and that the maximum tree size, without further release, will be limited to about that predicted diameter. Thus in the opinion of the writer, future considerations of tree spacing, response to release, and growth prediction must take more and more account of crown diameter until given equal emphasis with crown length. This is further substantiated by a study of increase in growth after partial cutting of loblolly pine (*5*). Of five factors studied; diameter, crown ratio, crown width, total height, and basal area before cutting, the crown ratio and crown width had greatest influence on the increase in basal area growth after release. Two more recent studies of the growth of red oak and white ash (*3*) and of yellowpoplar (*4*) showed that the correlation of basal area growth with crown diameter was higher than with crown length. These results all tend to demonstrate the importance of crown diameter and suggest possibilities of determining tree vigor or growth rate from aerial photographic measurements and correlations.

For rapid approximation of d.b.h. from crown diameter the following rule of thumb or short cut is suggested: "the stem diameter (inches) is equal to five plus one-half the crown diameter in feet." This rule has been shown to give satisfactory results on all the species of southern pine encountered in this study, regardless of stand density.

Summary

Linear regression equations have been prepared describing the relation between stem diameter (breast high) and crown diameter for loblolly and longleaf pines in southeastern Louisiana. High degrees of positive correlation were found for both equations. The effect of stand density, in terms of trees per acre, upon the stem-crown diameter relation was analyzed for loblolly pine. Curves were fitted to these data by holding crown diameter constant and determining the regression of stem diameter on trees per acre. The effect of density was concluded negligible for practical estimations, probably because of stabilization of basal area per acre within the sawlog stands sampled. Some practical applications of these results to aerial photo interpretation for forestry purposes have been described.

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Converting Mature Northern Hardwood .. Stands to Sustained Yield[1]

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THE DAY of the simon-pure silviculturist who lived and worked on a high plane untouched and unmoved by the economic struggles of those who strive for gain is past. Just as surely, the timber opportunist who looks only at immediate dollar return with no regard for the resource is going out of business—and fast.

Most foresters appreciate that silviculture simply for the sake of growing trees is impracticable, and that harvesting timber for immediate profit alone is improvident. The silviculturist can do, practically, only those things which economics will let him. The economist can go only so far in the realization of his theoretical returns and comfortable margins as a resource, subject to the laws of nature, will let him.

The successful forest manager of today and even more so the successful manager of the future, it would seem, must have an understanding both of the silvicultural principles underlying his stands and of the economic considerations and pressures which influence a forester's actions so strongly.

I have been asked to discuss the joint role of economics and silviculture in converting mature hardwood stands to sustained yield. All my experience has been with northern hardwoods in the Lake States. My discussion, therefore, is based entirely upon Lake States stands and Lake States conditions.

Unmanaged Stands

What is this old-growth northern hardwood forest like before the silviculturists and the economists begin to mold it to suit their fancies?

It is very old, many trees ranging from 300 to 400 years of age. It is overmature, with heavy defect in most areas. Growth is slow and mortality is high.

Sugar maple, yellow birch, and American elm occur throughout the type. Hemlock is an important component in some places; beech and basswood are found in other areas. Balsam fir, white spruce, and eastern hophornbeam (ironwood) appear as scattered individuals. Sugar maple, hemlock, and balsam fir are very tolerant, and able to perpetuate themselves in deep shade. Yellow birch and basswood, both high value species, and elm are less tolerant and usually originate in openings. Large trees, small trees, and at least several age classes are normally present.

Merchantable length varies from one to one-and-a-half 16-foot logs on poorer sites in the northern part of the range to four logs on the best sites. Volume varies similarly from 2,000 or 3,000 board feet per acre on poor sites to 25,000 or 30,000 board feet per acre on good sites where hemlock is present in quantity.

This old forest is a valuable one. (Sugar maple veneer logs are worth $125 per thousand board feet and yellow birch veneer logs are worth $175 F.O.B. railroad car at this writing.) Many industries are built upon it; many people depend upon it for their living.

Method of Cutting

What methods of cutting are the silviculturists recommending for the forest just described so that returns large enough to satisfy the forest economists can be obtained—and this even during the transition to sustained yield?

An adaptation of the selection method (partial cutting, I will call it) is being used currently on most northern hardwood forests under management in the Lake States. It was advocated originally as a stopgap to keep old-growth forests and the industries dependent upon them going until second-growth stands were large enough to use. It is still fulfilling this purpose. The selection method of cutting may or may not be the best silvicultural system for northern hardwoods in the final analysis. At this stage of the game, it does appear promising.

I have no intention of embarking upon a discussion of the selection method versus clear cutting nor of all-aged versus even-aged silviculture. However, there are several rather strong economic as well as silvicultural reasons why the selection method appears suited to the northern hardwood type as I know it. The main elements leading to this conclusion may be summarized as follows:

1.—*The tolerance of sugar maple, the principal species in most stands.* Anyone who has worked with the type realizes that less tolerant trees like yellow birch fare rather badly under light partial cutting where an even canopy is maintained. In order to establish these species successfully in well-stocked stands, small group openings up to 0.1-acre in size must be created within seeding distance of seed trees.

2.—*The capacity for growth response following release of this same principal species, sugar maple, and of thrifty hemlock.* Repeated stimulation of residual trees at short intervals should increase board-foot production markedly over a rotation and so improve the economic situation.

3.—*The abundant natural reproduction which develops or seeds in following cutting.* Planting or other special regenerative measures are rarely needed in the type, which means a saving in one item of investment expense.

4.—*The fire resistance of the northern hardwood forest.* It has been termed the "asbestos forest" by envious pine foresters. Surely, it will burn, but it does take extreme conditions and a residual stand is reasonably safe from fire. One element of financial risk is thus minimized.

5.—*The resistance of the type to disease and to insects provides further advantage in the matter of risk.* To maintain "status quo"

[1]Paper presented at a joint meeting of the Division of Silviculture and the Division of Forest Economics, Society of American Foresters, Washington, D. C. December 15, 1950.

as far as composition is concerned often seems enough to keep northern hardwoods in a healthy state.

6.—*The lower logging cost and higher financial return in removing mostly large logs.* Economic studies have been made to prove this point. Perhaps better proof, however, is the reluctance of many operators to return to clear cutting once they have cut selectively.

7.—*The high value of the choicer logs, making the individual tree selection and marking possible.*

8.—*The advantage of retaining trees just approaching a size where high grade products will result.* To cut them prior to this stage means the virtual loss of 30 or 40 years of growth.

Obstacles to Adoption of Sustained Yield

Several characteristics of the northern hardwood type which adapt it quite well to the cutting method most commonly employed on managed forests have been enumerated. There are some stiff obstacles, as well, to the adoption of sustained yield on the same acre or at least on the same property. Chief among them are:

1.—*The poor distribution of size classes in so many stands.* The lack of intermediate trees appears at first glance to be primarily a silvicultural problem in the solution of which economics cannot play a direct part. Yet, there are economic implications, too. Lengthening the cutting cycle or in some cases passing up harvest cuts may be necessary until satisfactory distribution is attained. This imposes economic strains when a regular periodic return is desired and needed.

Acquisition of forest lands containing the size classes missing originally may be possible in some instances. Purchasing outside stumpage or making mutually advantageous arrangements with other forest properties may help to sustain production during the period of adjustment.

Possibly the biggest contribution economics can make in meeting this particular problem lies in furthering an understanding of the advantages which lie in continuous production from one forest property. Matthews[2] lists these advantages as:

a.—The establishment of permanent market connections and business good will."
b.—The establishment of a permanent, skillful, and contented labor force which does not have to be periodically increased or reduced.
c.—The development of permanent financial connections which permit financing of the necessary business transactions at low interest rates.
d.—A reduction of physical equipment to the minimum in relation to total output of products over a period of years.

2.—*The old age or overmaturity of many trees in the stands.* Good silviculture may call for the retention of some of these individuals until new growth is well established or until deficiencies in certain size classes are made up. At first glance, economics may seem to demand the removal of all such trees, representing as they do a high value and a high risk. From a long-range point of view, however, may not the silvicultural benefits just mentioned be the best economics?

It would be most helpful in northern hardwood management if the forest economists would give us the basic principles and guide lines so that we could determine economic diameter limits for our principal trees. How big can we afford to grow them? Of course, most of us have at one time or another taken a stab at such a calculation. It appears from straight financial computations, that most sugar maple trees will not earn 3 percent compound interest above 20 inches d.b.h. It is hard to believe, however, that the economic limit for one property will necessarily be the same as that for another property with different management objectives and different utilization outlets. Special uses may result in a premium on certain size material and so alter the economic limit. A true and complete picture of economic diameter limits under a variety of conditions would help to meet this problem of conversion.

3.—*The large volume and large proportion of cull and low-grade products in these old stands.* Silviculturally, the cull and defective trees should be removed to reduce mortality and to make way for new growth. Economically, it is now difficult to meet out-of-pocket costs for low-grade material, let alone to show a profit.

Here, economics can demonstrate how far we may proceed in the matter of stand clean-up and still retain the earmarks of a going business. We must recognize marginal products. If we wish to move submarginal material for silvicultural good, it should be understood that it is being done at a cost—that we are adding to the investment in the property by so doing. In appraising the soundness of such investments the forest manager again seeks the guidance of the economist.

In deciding whether to move or leave present low-grade material, consideration must be given to possible future demand for such goods. In recent years we have seen how formerly worthless and sub-marginal material has become valuable and sought after because of new uses and new developments. It seems reasonable to expect more of the same in the future.

In addition to the three obstacles already listed, which may be more or less peculiar to the northern hardwood type, there are several general management problems which serve to increase the difficulties of converting to sustained yield. While encountered in the management of other types as well, they still must be considered in appraising the conversion of old-growth northern hardwoods. They are:

1.—*Insufficient acreage and volume of mature timber to support present utilization facilities.* This can be a very real and very powerful obstacle to sustained yield. The high investment in plants and mills exerts a strong pressure to keep them going at full capacity as long as there is timber.

There is a job for economics here in convincing forest industries that to retrench and reorganize at this point may be most advantageous in the long run. It is possible in

[2]Matthews, Donald Maxwell. Management of American forests. 1935. p. 78.

some cases to maintain existing economic values and employment with less wood by expanding the fabrication of the manufactured product. Silviculture can provide a fair estimate of the productive capacity of our current stands. We must look to economics to bring utilization into adjustment with sustained yield production.

2.—*Threat of higher taxation.* In the past 10 or 15 years owners of timberland who have demonstrated a willingness to manage their forests with an eye to sustained yield have received fair treatment in the matter of taxes. Recently, however, there are signs in Michigan at least of a tendency for local units of government to put the squeeze back on forest properties. Even with the 15-mill limitation now in effect in this state, it is possible for local governments to levy taxes in excess of the limitation by voting in bond issues for schools and other improvements.

A good lesson in forest economics should convince these local boards that equitable taxation for local forest properties, lending encouragement to long-time management and sustained yield, will pay off handsomely in community benefits over a period of years.

3.—*Uncertainty as to how good a business sustained-yield forestry really is.* We silviculturists will have to admit that in the job of selling sustained-yield forestry to timberland owners, both large and small, we have been found wanting and only recently have attempted to make amends. We have talked individual tree selection, cutting cycle, average annual increment, and optimum stocking. What these owners really want to know is, "How good a business is sustained-yield forestry?" They are far more conscious of the risks involved, the long tie-up of invested funds, the uncertainty of markets, and the hundred and one other difficulties, than they are of the continuous financial returns possible. Convince them that sustained yield forestry pays and they will hire the professional foresters to cope with forestry technology.

The forest economists can step to front and center here. In supplying methods and techniques for determining bona fide, realistic, cost and returns information, they can do practicing foresters and research specialists in silviculture and management a big favor.

As a silviculturist who has picked up a smattering of economics the hard way, I have no fear how sustained yield management of northern hardwoods will rank in such financial appraisals. Managed stands can return a fair rate of interest on the investment in land, growing stock, and improvements while providing the raw material so essential to many industries. I see no reason for foresters to shy away from compound interest or become apologetic when the matter of return on investment is up for consideration. After all, for the 12 months ended December 31, 1949, net railroad earnings were at the rate of only 2.91 percent on net investment. We can do as well as that, or better, in northern hardwoods in the Lake States.

Sustained Yield in Actual Practice

The discussion to this point has been general and somewhat academic. How is the conversion of old-growth northern hardwood stands in the Lake States to sustained yield actually working out? How far have we advanced toward attaining for our major stands "continuous production with the aim of achieving, at the earliest practicable time, an approximate balance between net growth and harvest, either by annual or somewhat longer periods"?[3]

There are in the Lake States, numerous northern hardwood forests both in private and in public ownership on which at least a start toward sustained yield has been made. They add to well over a million acres, or about one half the total regional saw-timber acreage in the type. Offhand, I can think of fourteen such forest ownerships receiving high-caliber management.

Considerable variation exists in the degree to which growth and harvest are in balance. In most cases true sustained yield is still some years away—the length of time depending upon original and present stand condition, utilization outlets available to and dependent upon the forest, and other economic considerations. In some instances the first cut was heavy. Cull and defect were reduced to a low point, but growing stock must now build up again before an operable accumulated growth can be removed at short intervals. Again, deficiencies in certain size classes must be made up before periodic cuts are assured.

Among all Lake States hardwood forests, that of the Goodman Lumber Company in northeastern Wisconsin is perhaps the closest to sustained yield. Here, a first cut heavy enough to reduce cull to a low level is being followed by light harvest and improvement cuts at short intervals. A good original stand, a complete road system, utilization outlets nicely adjusted to forest growth, and a high order of management control have combined to produce a forest property inspiring to silviculturists and economists alike.

My closest personal contact has been with the Upper Peninsula Experimental Forest at Dukes, Mich. I would like, therefore, to draw upon this experience for a concrete example illustrating the problems of conversion.

An experimental management unit of 4,200 acres, over half of which was in upland hardwoods and hemlock, was acquired by the government in 1935. A plan of management, simply, optimistically, and without more ado, placed the property on sustained yield in 1938. There would be cut each year, on the average, the equivalent of annual board-foot growth. Operations would be budgeted so as to cover the hardwood areas in 10 years. The stands would be improved by confining the cut to the worst trees. This plan was followed and substantially carried out during the 10-year period.

"Is conversion to sustained yield really as simple as this?" We are convinced that it is not.

In limiting our cut to the equiva-

[3]Forestry terminology. Society of American Foresters. 1944. p. 83.

lent of growth we were able to take out only those trees which, judged by appearance and condition, would surely die or be lost otherwise during the next 10 years. Additional trees expired following logging, causing growth reduction through mortality and necessitating salvage operations. In selecting only the worst trees, cull amounted to 70 percent of the gross volume removed. Moving 8 to 11 cords of marginal (or submarginal) chemical wood per thousand feet of logs is rather dreary economics.

Results were not all negative, however. The light improvement cut did reduce mortality and stimulate growth to the point where average annual volume increment exceeded losses by 73 board feet per acre.

In 1948 the management plan was revised. During the intervening years much had been learned about stocking for maximum growth and highest financial return in the area. Experimental cuttings in the same vicinity had demonstrated that a somewhat heavier cut would have produced better results. Much had been learned about sizing up mature timber and detecting signs of decadence. The management unit had been reduced to some 1,400 acres to provide additional stands for experimental cutting and for other uses.

Marking is now aimed at leaving from 65 to 70 square feet of basal area per acre in trees 10 inches d.b.h. and over. For the experimental forest this means a residual merchantable volume per acre of from 6,000 to 6,500 board feet, Scribner Rule. It is recognized that this stocking is a goal which may not be reached over the whole hardwood area until after several cuttings because of faulty distribution of size classes and excessive irregularities of spacing in some stands. Most good trees have to be retained regardless of size or position in this marking, and may have to be treated the same way in the next several cuts. Although as many undesirable trees as possible are being removed, some have to be retained temporarily in order to "plug" large openings which would be created if they were removed. The goal of 65 to 70 square feet of basal area or 6,000 to 6,500 board feet will be attained just as soon as distribution and tree condition in the stands permit.

In cutting towards our stocking goal, we are removing more than the annual growth during the current 10-year period. Of course, this is a temporary condition, and we hope to be in position to cut only the equivalent of growth on some areas during the next cutting period and to reach sustained yield in fact as well as name for the entire unit within the next two or three 10-year periods. Overcutting growth on this tract illustrates one fundamental difference between regulation of cut in virgin or overstocked stands as compared to second-growth or understocked stands. In the one case it is advisable to overcut growth in reaching the stocking objective; in the other, it is necessary to undercut growth and so increase stocking to the desired level.

Once we have the stocking, the stand distribution, and the stand condition desired, we should be able to cut 1,500 to 2,000 board feet per acre every 10 years, provide for profitable logging operations, and return from stumpage at least 3 percent compound interest on the investment in land and growing stock. Complete and accurate financial records, being kept on the management unit during the current cycle, tend to substantiate this assumption—at least for the period July 1, 1949 to June 30, 1950. A continuing research effort is needed to wring the maximum silvicultural and economic benefit from this and other management experiments.

Joint Effort Needed

The solution to many problems in managing old-growth northern hardwoods and converting them to sustained yield calls for the best that economics and silviculture, working together, have to offer. There must be a compromise here and there. Silviculture must yield a little to economics upon occasion; economics must yield a bit to silviculture at times. In northern hardwoods, for example, we cannot always eliminate completely the cull and defective trees in the first cut. On the other hand, it would be wise to sacrifice a little immediate profit for improved stands and better operations in the future.

Both economics and silviculture would do well to enlist the continued and strengthened help of a third partner—utilization. New uses and higher priced uses for the material silviculture wants to move will make for a brighter economic picture.

A Correction

An error had been noted in the article "Observed Effects of Prescribed Burning on Perennial Grasses in the Ponderosa Pine Forests" by Harold Weaver, Journal of Forestry 49:267-271.

Fig 1, page 267, should read, "This photo was taken in July *1945*—almost *two* years after the area was burned during slash disposal operations of October 1943."

HAROLD WEAVER.

New Trends in Control of Noxious Range Plants[1]

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WHAT MAY BE regarded as the first efforts to control noxious range plants began almost 50 years ago with the hand grubbing or pulling of larkspur, deathcamas, and other poisonous range plants. A broader concept of noxious plants as any encroaching low-value species which uses water, light, or even space that should be available for the growth of productive forage species began to take form in the 1930's. Then it was recognized that many aggressive native and introduced plants, if uncontrolled, would lower forage production and grazing capacity, complicate the handling and increase losses of livestock, interfere with successful reseeding, increase fire hazard, or provide unsatisfactory watershed protection. Examples can be cited from almost every section of the range country; saw-palmetto and gallberry in the Southeast; blackjack oak in the South; sand sagebrush in the plains; mesquite, cacti, and a host of other shrubs and half-shrubs in the Southwest; big sagebrush and cheatgrass in the Intermountain region; and St. Johnswort in California and the Northwest.

Only in recent years has the urgent seriousness of noxious plant invasion on western ranges been generally recognized. Ranchers in every western state are searching desperately for control methods. An idea of the magnitude of the problems is indicated by the fact that since 1936, an estimated 81 million dollars has been spent in shrub control efforts in Texas alone and, on much of the 18 million acres treated, only temporary relief has been obtained.

Although the problem has only recently been recognized, it has been developing for a long time. Big sagebrush thickened and spread following the original deterioration of former grass or grass-brush ranges during the early days of livestock use of the West. Mesquite, now a menace on over 60 million acres in the Southwest, invades by means of seedlings which may stay "in the grass" and not become evident for decades. Yet, once established, they will increase in size and number until they form a complete canopy despite any known type of grazing management, as well as total nonuse.

Developments to Date

Practically every method that offered any promise for removing undesirable range plants has been tried. Cheaper, wide-scale control methods are needed, but methods that are valuable, at least on limited areas or under certain conditions, are known for most species. Controlled burning, railing, or if reseeding is involved, disk plowing is effective on big sagebrush. Mechanical uprooting by bulldozers, "stingers," or cabling is being used on juniper, mesquite, and other large species The trend in mechanical control has been toward ever larger and more efficient machines. A spectacular example is the cabling of mesquite being done in the Southwest, where a 400-foot loop of 2½-inch cable or 8-inch anchor chain is dragged behind two very large crawler tractors. Initial costs are low, but many trees are left and must be removed individually to provide satisfactory reduction in the stand. Indications are that mechanical control methods will not provide the full and final answer for most species, although they offer the best available method for many species now, and are being widely used.

Application of diesel oil on the stem base is a proven method for killing individual mesquite trees. It is being used to clear special holding traps, small pastures, and areas needed for working cattle but is too costly and laborious for general use on extensive ranges where trees are abundant and well established. Ammate applied in girdles, bark frills, or cups is effective for killing undesirable shrub oaks in parts of the South.

Biological control by introduced beetles is giving good results on poisonous St. Johnswort, and the possibilities of culturing insects or diseases that might provide a self-generating, self-disseminating, and complete control method for other species stimulates the imagination. It should be remembered, however, that biological control methods have been successful only on introduced species. To be successful, the controlling organism must be released without the predators that tend to keep it in check in its home land. Long established natural balances have developed between most native noxious plants and the diseases and parasites that prey on them.

Selective hormonal herbicides have provided the most exciting recent development in noxious plant control. The now familiar 2,4-D applied by airplane at a total cost of about $2 per acre has been almost completely effective in eliminating sand sagebrush. Within three years after the first trials, several hundred thousand acres of southern plains range lands were being sprayed annually. So far results have been generally good, but occasional sprayings are unexplained failures, indicating that even here, we have much to learn.

Control by hormone sprays has not been so simple in the case of other range plants, but some degree of success is being obtained on several species. Thus, airplane spraying of mesquite in both Arizona and Texas has given kills of 50 percent or more of the plants on the test plot. Even better kills have been obtained with big sagebrush, but the results are very inconsistent. Even Utah juniper has been completely killed on small plots where foliar sprays were applied by ground methods. Selective

[1]Paper presented on a meeting of the Division of Range Management, Society of American Foresters, Washington, D. C. December 15, 1950.

herbicides promise to play so important a part in future developments that a brief review of their characteristics is justified.

Potency.—Compared with other chemical herbicides, the new formulations are extremely potent. The recommended dosage (2/3 pound) to treat an acre of sand sagebrush range can easily be held in the palm of one's hand. Indications are that if that amount of herbicide could be applied directly to the critical parts of mesquite plants, it could treat 100 acres. Other plants are much more susceptible than mesquite. It has been estimated that 1 ounce of 2,4-D will seriously affect every cotton plant in a 35-acre field.

Specificity.—To the range man one of the most attractive features of 2,4-D and related compounds is that it is nontoxic to grasses and many other valuable forage plants. The various forms of 2,4-D and the related 2,4,5-T show differential toxicity to the various shrubs and broadleaved herbs, so that it is possible to kill certain plants with little effect on others. Other new herbicides such as the salts of trichloroacetic acid are specific for grasses and are valuable for controlling weedy grasses in row crops. They may have a place in controlling undesirable range grasses such as cheatgrass.

Toxicity.—The hormone weed killers are not toxic to animals, and there is no danger to the operator who handles them. Because even minute quantities can be disastrous to such valuable crops as cotton, alfalfa, and small fruits, however, care must be used in spraying ranges with interspersed crop land.

Some Probable Future Developments

The future of noxious range plant control seems to be firmly tied to some kind of mass application of a selective herbicide from the air (Fig. 1). There will always be a need for on-the-ground, hand or machine control for cleanup and for initial invasions where the stand is scattered. But the vast areas already heavily invaded, and the relatively low values of the lands involved, require that the main reliance be placed on a low cost, rapid and extensive method. Such a control method is well beyond the experimental stage in the case of at least one range plant, sand sagebrush. Other important noxious plants are less susceptible to presently available herbicides, and although progress is being made, it is not yet possible to state what combination of chemical, formulation, carrier, rate, season, and environmental factors is required for satisfactory and consistent kills. Enough has been done, however, to show that airplane spraying is feasible and far superior for treating large areas to any other method, provided that lethal sprays can be found.

FIG. 1.—Airplane spraying is an efficient and effective method for applying the new selective herbicides. Experimental airplane spraying of mesquite with 2,4,5-T on the Santa Rita Experimental Range, Arizona.

The effectiveness of broadcast spraying of small amounts of material makes airplane application particularly attractive. Costs of flying vary with the size of the area, the landing and loading facilities, and the amount of oil or water carrier required. The carrier—usually an oil-water emulsion—weights from 40 to 60 times as much as the active herbicide in most solutions recommended today. Any reduction in the amount of carrier would mean a corresponding increase in the area sprayed with each trip of the plane and would be almost directly reflected in reduction in the per acre cost for flying.

Future research on noxious plant control will have to be directed at obtaining a better understanding of the basic principles. Indeed, one of the reasons for optimism is is the fact that we have been able to make real progress with only a limited knowledge of some fundamental questions. How do the various herbicides enter the leaves, stems, or other tissues on which they are sprayed? How do they move within the plant to reach the critical parts? How do they actually cause death? These are knotty questions, but they are receiving increased attention. As the answers begin to appear, control procedures can be devised more rapidly and recommendations will have a sounder basis. We will be better able to explain the highly variable results that are often obtained under very slightly different physiological and ecological conditions, and results should be more consistent.

It is also clear that research will have to be directed specifically at each problem species. Big sagebrush does not respond in the same way as the closely related sand sagebrush, and results cannot be transposed from one to the other. In the case of mesquite, even varietal or racial differences in response appear to exist.

Research will also be needed to solve special grazing management and other land use problems which result from noxious plant invasions. We need to know more precisely the optimum numbers and class of stock to graze and the best

grazing season to prevent further spread of noxious plants and to minimize reinvasion of cleared areas. Too many ranges have "gone to brush" even under careful management — management that was considered as proper in the light of available knowledge. This brings us to the pay-off question for research—why do these undesirable range plants come in? We know that climatic fluctuations, changes in the pattern of range fires, use by domestic livestock, rodents, and other animals, and other factors contribute to the increase of noxious plants. Ecological knowledge does not yet permit us to say just how these factors are interrelated, nor how they can be manipulated to best advantage. Research to provide this information is essential to guide the management of range lands so that they can produce the greatest sustained yield of forage and range livestock products and the highest net return to the rancher consistent with maintenance of the soil and other natural resources.

Survival of Loblolly Pine Seedlings as Influenced by Depth of Planting

Observations and experiences over a number of years have convinced the writer that improper handling of seedlings before planting, rather than the planting operation itself, has been responsible for poor survival of loblolly pine in many areas. It was with this observation in mind that the following experiment was initiated in February 1949 on the Hill Forest, 1,500 acres located in Durham County, North Carolina, owned by the Forestry School of North Carolina State College.

An old field in the broom-sedge stage was selected as the planting site. Exposure was due east with a slope of 8 percent. Three groups of thirty trees each and an average height of 9 inches were selected at random from bundles of nursery stock grown in the forestry school nursery. The trees were planted with the aid of a planting bar. Roots were straightened in the hole so that root curl and twist would not be a factor in survival. The trees were planted under the following conditions:

Row 1—30 trees, planted at correct depth.

Row 2—30 trees, planted with one-quarter of stem (2.25 inches) underground.

Row 3—30 trees, planted with one-half of stem (4.50 inches) underground.

An examination of the area, made in April, showed that rabbits had cut one tree in each row, but the trees were still living. All other trees were alive at that time.

On October 26, 1950 a first-year growth and survival check was made. It was found that one tree had died in each row. Survival was identical in all cases—96.7 percent.

Total and current height growth measurements show the following results:

Row No.	Average total height	Average current growth
1	17.0 inches	8.0 inches
2	15.5 inches	8.7 inches
3	13.7 inches	9.2 inches

Current height growth was best on those seedlings that had 4.5 inches of stem buried underground. There was no effect on survival regardless of planting depth. This increase in height growth of the trees in Row 3 is possibly due to the roots being located in a strata of more uniform moisture content.

This information should be of interest to operators of planting machines, since exact planting depths are difficult to obtain when machine planting and many trees are planted "too deep."

The experiment was duplicated during the 1951 planting season with two additional planting conditions. One row of trees was planted with three-quarters of the stem underground and one row with one-fourth of the root exposed.

Careful handling of loblolly pine planting stock from the time of lifting to planting is the most important consideration. Trees grown in the North Carolina Forestry School nursery are exposed only for the time necessary to count a bundle of fifty. Planting stock is always carried in wet burlap during the field planting operation. In planting approximately 300 acres with our own stock, the survival 10 years after planting has averaged better than 90 percent. In one plantation of 85 acres planted by the W.P.A. labor and completed on May 8, 1939, an approximate 4 by 4 foot spacing was used because of the lateness of the season and the expected consequent loss. In 1940, survival checks showed 97 percent survival. Prethinning counts in 1950 gave an average of 2,700 stems per acre.

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Use of Economic Principles in Wild Land Management

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MISUNDERSTANDING of some fundamental notions of economics sometimes may lead to rejection or abuse of useful "working tools" in wild land management. It has been declared, for example, that resource devastation is encouraged by management oriented to economics rather than to ecology (*3*). Discussions disapproving the multiple use idea (*2*) likewise may be suspected of lack of attention to elementary economic principles. This paper is intended to point out that economics may be a better guide to the wild land manager than is plant ecology, and to show the connection between economics and the multiple use management concept.

Conservation of natural resources has been defined as the rate of use which maximizes the present value of the net returns over time (*1*). Conservation is achieved by management which calculates net returns in terms of individual and social gains and losses. In wild land management this evaluation must go beyond monetary calculations, as is well known, and for renewable resources it obviously involves maintenance of resource productivity at an optimum level. Economics finds this notion of conservation an acceptable management goal.

Economics is concerned with production which is most useful to the human community, maintenance of the level of production at an optimum, and the use of resources (including plant communities) in the most efficient manner. The optimum economic level of production from wild lands is always less than the maximum physical level. Thus vegetation is maintained on watersheds to prevent soil loss and downstream sedimentation although its destruction might increase total water yield. Similarly, intensification of silviculture practices, for example by fertilizing woodlands, increases the physical product but eventually decreases economic returns.

Presumably ecology stresses plant-animal community relations and physical production and is therefore a less comprehensive and less useful management guide than economics which considers both the biotic community *and* the human community.

So obvious as to be hardly worth comment is the fact that *many* disciplines contribute to the varied activities of wild land management. The point made here is the relatively small one that the social science, economics, achieves more generality than the narrower physical science, ecology, and is of greater immediate usefulness in wild land management decision making.

Wild land economics has an outlook broader than the short-run monetary one which frequently characterizes business administration. Immediate monetary gain may be the motivation for the type of wild land management that results in permanent destruction of ground cover and reduction of operating resources to a less-than-optimum level. Business administration may fail to include in its calculations the returns and costs which impinge on other members of the human community or which take effect far enough in the future to be of little interest in current operations. As distinguished from this short term view, economics does take cognizance of all present and future effects of management practices. The goal of wild land management based on economic principles is, therefore, the goal of conservation.

Multiple use is the rational way to manage an area of wild land. According to economics, to get the greatest net return from the management unit, productive efforts should be expended in small quanta (units of man or machine hours, dollars of capital expenditure, or land area small enough to be usable for a single purpose only) on the activity which returns the most per quantum of successive input. The continued application of input quanta will eventually bring an increment to returns which will be smaller than if the same productive effort were expended on another activity or area. At this point, then, it is more advantageous to switch to the other activity or to another area. If the change is made to another activity in the same management unit then multiple use is effected. Additional quanta of effort will be expended on activities bringing the greatest increment in returns until a point is reached where the addition to returns approximates the addition to cost, with returns and costs evaluated completely and from a social viewpoint. This is the limit of justifiable productive activity and on wild lands may be beyond the limit of feasible operation of private enterprise.

To illustrate the process of "incremental calculation" in management, a typical western national forest grazing allotment may be assumed. This hypothetical allotment consists of grass, brush, and alpine timber areas with several lakes and streams. The product or land use which meets an essential human need and is most restricted as to area in which it can be produced tends to become the most valuable in its area. Culinary water is such a product, and the land manager must usually assure protection of the water supply before expending effort on any other production activity. Although the net money returns from the water supply may be small, or even negative, the nonmonetary values provide the economic basis for calculating the allowable protection and development expenditures.

How much land should be included in the protected watershed and what improvements should be developed depend upon the effort or cost necessary, and the expected value returns. If a quantum of contemplated expenditure will return more in developing needed recreation areas, the watershed

work is left at a stage which meets minimum expected needs, and attention is directed to providing minimum recreational facilities.

The recreational development then continues until a quantum of proposed expenditure may be expected to return more in, for example, range improvement work. This process of comprehensive cost-and-return calculation is familiar to wild land managers, and provides the basis for development of work plans, assignment of job priorities, preparation of district rangers' job lists to subordinates, and similar routine management tasks.

If the hypothetical grazing allotment did not have the water supply and recreational products, the "incremental decisions" would be made among grazing developmental activities such as improvement of livestock water supply, fence building, trail construction and maintenance, road work, corral building, and shelter construction.

Multiple use management can therefore be thought of as the maximizing of the present value of net returns by expending successive small quanta of productive effort in the activity bringing the greatest return until returns and costs are equal, measured from the long-run social viewpoint. Some management units will reach the limit of justifiable expenditure with only one activity in operation, whereas others may have a hierarchy of uses, the final increment of return from each use being equal to that from every other and to the final increment of effort measured as cost.

The management units for which the returns-costs incremental calculations are made may be any units considered convenient for management decisions. Thus we may have multiple use on a national forest ranger district, multiple use on a working circle or grazing allotment, but single use on an important watershed. The incremental calculation of returns and costs is a tool economics provides for making multiple use management decisions squarely in line with the conservation goal.

Economics may be criticized for its failure to provide better measures of social returns and costs. Economics likewise has not yet provided satisfactory procedures for the incremental returns-cost calculation for wild lands. To accuse economics of resource devastation, however, is to misunderstand its elementary principles.

Wild land management may be termed an eclectic art, the ruling guide for which is the fact that economics, ecology, engineering, and other branches of learning are complementary rather than mutually exclusive.

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Forestry Excursion in Western Germany, September 1951

A newly organized society in Hamburg, "Gesellschaft zur Förderung des Kongresswesens" (Society for Promotion of Conventions), has planned a forestry tour for Scandinavian foresters from September 12-20, 1951, but it is understood foresters from other countries will be welcomed if space permits. The party is limited to 100. The tour will include hardwood forests in Schleswig-Holstein, nurseries at Halstenbek, and the forestry institute at Hamburg. The last three days of the trip will be a joint field meeting with the Nordwestdentscher Forstverein in the vicinity of Düsseldorf. Expenses will be not over 20 marks per day. American foresters wishing to participate should communicate with Prof. Dr. W. Schmidt, president of the society, Hamburg 11, British Zone, Germany.

The Future of Forest Recreation[1]

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FOREST RECREATION, as discussed here, means largely unsupervised outdoor recreation in the forests and mountains. It includes such pursuits as camping, picnicing, hiking, skiing, fishing, hunting, enjoying inspirational scenery, wilderness travel, mountain climbing, vacationing at resorts and summer homes in the forest, or pleasure driving along forest highways and roads.

Fifty years ago forest recreation was confined largely to forest land near towns, in rural districts, or at vacation spots, because most people did not have ready access to the big forests and mountains in the United States, nor the time to enjoy them.

Thirty years ago forest recreation use in the more distant forests was entirely different than today. People spent a day or more on slow, sometimes dangerous roads or traveled by rail to get into the forest — then they stayed for a while. The well known inspirational areas of the national parks were served by vacation-type lodges, and in the national forests recreation use was concentrated at resorts and summer homes. Camping parties were few and picnicking was confined to attractive spots along the major routes of travel where the uncertain automobiles of that day could be trusted. Only the relatively wealthy could afford this kind of recreation and the volume of use was small.

A sizable increase in our population, together with the present highway system, the wide ownership of automobiles, fast air transportation, shorter work hours, the increase in the percentage of people living in cities, and higher living standards have changed the forest recreation picture so completely that there is little basis for a comparison between then and now. Events of the next 50 years may again change this picture so much that the present will be an inaccurate basis on which to predict the future.

Now millions drive to the forests and mountains in an hour or two—spend the day enjoying their favorite form of forest recreation and go back home at night.

Twenty years ago — skiing on the high western ranges was done by a few hardy mountaineers — now millions ski these same slopes, ride up on chair lifts, and are home for the night.

Any comparison of forest recreation use between now and 30 or 50 years ago must be made on the basis of this change in population, transportation, leisure time, living standards, and the increased percentage of people living in cities. The forest recreation resource has simply been made available to tens of millions instead of thousands, and city living has made outdoor recreation more of a need for many people. Therefore, the fact that recreation use of the national forests has grown from about 5 million man-days in 1921 to 37 million man-days in 1949 may mean only that people have eagerly taken the opportunity to enjoy forest recreation when it was made available for them and was within their reach in point of time and expense. It does not necessarily mean that people's inherent needs and desires have changed, nor that they will.

The present volume of forest recreation use shows how important it is in the whole picture of national recreation. Federal forest areas, including the national forests, national parks, Tennessee Valley Authority, Bureau of Reclamation and Corps of Engineers reservoirs, Fish and Wildlife Service areas, and public domain received some 80 million recreation visits in 1949; state parks and forests received 120 million visits; and private forest lands probably accounted for another 20 million—a grand total of some 220 million visits annually to enjoy forest-type recreation.

That total visits to outdoor recreation areas speaks for itself and emphasizes the tremendous appeal of forest recreation for the American people. No one knows how many individuals that total represents because it is impossible to segregate repeaters — so we can only guess that one out of every four Americans spent some time enjoying forest recreation.

The Year 2000 A.D.

Now, let us look into the future and speculate on the changes and developments which may take place in forest recreation. I shall not attempt to prove any of the predictions made. I shall express merely what I believe will happen —not necessarily what I hope will happen or what I think should happen.

Most certainly the predictions made here are not necessarily the aims or objectives of the Forest Service. They are only what appear to me to be the most probable results of the present and future public recreation demands and needs in relation to the forest lands which can be made available for recreation use.

In these predictions it is assumed that our population will continue to grow and that it will be around 200 million by 2,000 A. D. and that the world will enjoy generally peaceful conditions. If these assumptions are correct, it is a safe conclusion that American ingenuity and "know-how" and the productiveness of our great free enterprise system operating under our republican form of government will enable most people to increase their standard of living and their leisure time. It seems probable that the trend toward urban living will continue and that this will result in a stronger urge for outdoor recreation — much of which will be forest recreation.

Let's skip the details of the transition and the many controversial issues which were discussed and settled through the years and look around in the forest and park areas of the year 2,000 A. D.

[1]Paper presented at a meeting of the Division of Forest Recreation, Society of American Foresters, Washington, D. C., December 15, 1950.

The use of forest areas for recreation has quintupled since 1950 and it has been necessary to do much intensive recreation planning in connection with general forest land use planning. Thousands of new forest recreation areas have been established to accommodate the increased use.

The broad principles of recreation planning are still much as they were in 1950. Areas of outstanding scenic and inspirational character are set aside exclusively for that purpose as national parks. In other forested areas, lands primarily valuable for recreation use are developed or reserved for recreation. The recreation potential of all forest lands and all bodies of water is considered fully in managing the land and water, and recreation value is never destroyed or seriously damaged unless that is necessary to harvest a greater public benefit. Great forward strides have been made in utilizing the recreation resource of municipal watersheds without impairing the watershed or the purity of the water. Correlation of municipal, state, private, and federal forest recreation areas is given special emphasis so that the combined facilities complement each other and do not conflict or duplicate. There is universal awareness that forest land suitable for recreation is barely enough to accommodate the use — if the land is given the best management and protection.

Associations of forest recreationists are active in all matters pertaining to forest land use and are constantly on the alert to prevent damage to recreation values and to promote better facilities for forest recreation and better administration.

Human needs and desires have not changed very much. A day spent in the forest picnicking, hiking, fishing, skiing, and sightseeing is still answering people's need for sport, enjoyment, a touch of nature, and relaxation. States, counties, and municipalities have accepted their responsibilities for local forest recreation. The federal government and states are cooperating in making areas available for tourist and vacation use. Private land is utilized for recreation when that is its most profitable use.

Camp and picnic areas are larger, but the individual sites are scattered and offer greater privacy. Facilities are simple and appropriate to the forest environment. Sanitation is recognized as a major responsibility and is never neglected. Areas are designed to accommodate a certain number of people and the gates are closed when all sites are occupied. It was learned long ago that overcrowding a forest recreation area greatly diminished the enjoyment of the people who wanted restful relaxation — and furthermore hastened the wearing out of the ground cover and the killing of the timber on which the beauty and attractiveness of the area depends. It was of course necessary to provide enough areas so that those people denied access to an area which was fully occupied could find another one a short distance further on. Rotation is practiced on all heavily used forest recreation areas so as to minimize the cumulative effect of soil compaction and litter destruction, which are the inevitable results of human occupancy.

Public recognition of the importance of keeping forest recreation areas in good condition has changed greatly. Willful destruction of trees and shrubs, careless car driving, and leaving messy camp sites are rare. Care with fire and smoking is a habit which practically everyone has acquired and regards as essential to the preservation of forest land and recreation. People generally know that if they want clean, attractive recreation spots they must all do their part by leaving a camp in clean and usable condition.

As a result of this public consciousness of good forest manners, it has been possible to allow camping and picnicking almost anywhere in the forest except during periods of extreme fire hazard. Many people prefer to drive off the main roads and select their own camp or picnic spot. People take pride in leaving these spots as attractive and natural as possible.

Admission Charge Established

At most large improved forest recreation areas an admission ticket is required, which pays for operation, maintenance, and depreciation. A federal recreation license costing $2 a year entitles a person to visit any federal recreation area. States have similar licenses for state areas, but most states reciprocate with the federal government and with other states and stamps are issued for 50 cents which can be attached to the license issued by another authority. It works well — the actual users pay for the operation of the recreation areas and find well-kept, clean areas which are a pleasure to use and are well worth the cost to the users.

Skiing has grown by leaps and bounds and more and more people are discovering the delights of the forest in wintertime — and the thrill of skiing on packed slopes with the crowds or touring through unbroken snow in a small group. The expensive problem of keeping roads and parking areas clear of snow has been solved by a ski stamp which must be attached to the recreation license. A $1 stamp pays for snow clearance on roads and parking areas and also pays for the ski patrol, including safety and first aid equipment. Many people take long ski touring trips and stop at isolated cabins in the back country which are operated and maintained by local ski clubs.

There is a general public understanding of the forest land use problem and how forest recreation fits into that problem. The growth of our population and the increased standard of living have resulted in heavy demands for forest products and forest recreation. It has become very apparent that forest land is a valuable and also a relatively scarce commodity which must be managed skillfully in order that these lands may serve their highest public usefulness.

Use Regulated

Public demand has brought forth laws which protect public

forest lands and prevent destruction of private forest lands. The mining laws have been revised. It is no longer possible to acquire title to government lands on the basis of mineral discovery. Leases are issued for exploitation of needed minerals when such exploitation is the highest use of the land, but all other public values are protected in so far as that is consistent with the efficient exploitation of mineral resources. Mining operations are prevented from damaging other values by polluting streams and letting noxious gasses escape into the air.

Forest lands suitable for forest-type recreation are not used for types of recreation which can just as well be enjoyed elsewhere. Forest lands are generally reserved for recreation appropriate to the forest, while facilities such as golf courses, baseball and football fields, race tracks, open air theaters, etc. are placed on areas which are not suitable for the more truly forest recreation pursuits.

All reservoirs with recreation value are very skillfully managed. The value of the water is appraised on the basis of its highest public use. Its value for power, irrigation and recreation are calculated. The maximum "drawdown" which can be made at a particular reservoir, without seriously affecting recreation, is known. The power and irrigation values are known. The requirements for the maintenance of fish life in the reservoir and below the dam are known. Every acre-foot of water is used according to its highest public value. In normal years the "drawdown" is limited during the recreation use season. If there is a shortage of water the relative values are considered to determine which use can be sacrificed with the least public loss. The states and the federal government have acquired sufficient water rights to protect the public interest in recreation use, and this water can only be diverted to other uses in times of emergency when it is clearly in the public interest to do so.

Use of wilderness areas has become very popular and there is general appreciation of this unique form of recreation. Wilderness areas are much as they are today. Preservation of primitive conditions of habitation, transportation, and environment is the major objective of management. Roads, permanent structures, airplanes, helicopters, motor boats, and motor vehicles are excluded. Trails are as primitive and natural as is consistent with safety. Only improvements essential for the protection of the area are permitted. Compromises with wilderness for the purpose of protecting the area, such as sanitary facilities, fire protection improvements, insect infestation control, air transportation of supplies and equipment to reduce trail travel, etc. are rigidly controlled and limited to instances in which the benefits to wilderness are without question greater than the losses.

It was recognized many years ago that the relatively small area of wilderness in the United States could not withstand the use it was receiving. Saddle and pack stock were limited to the available forage and the capacity of the trails.

People, too, are limited to the "wilderness capacity" of the area. This "wilderness capacity" is not related only to the physical aspects of the area nor to the type of people who used it. It was found that a wilderness just ceased to be wilderness when a certain concentration of wilderness travelers were in it. It is measured by how many parties you meet on the trail, how many camps you pass, and how many people you see on the fishing streams. If you meet too many people — in the wilderness — suddenly that elusive thing called wilderness is gone .

Fish and game are intensively managed because the demand for fishing and hunting is still increasing, and these sports rank high in the estimation of the people. In areas of low wildlife productivity or in areas easily accessible to population centers, fishing and hunting are on a strictly controlled basis. Only a sufficient number of hunters or fishermen are permitted to remove the harvestable wildlife crop which has been carefully determined in advance. On highly productive areas or in accessible places hunting and fishing go on much as they do today, but rigid controls may be exercised if necessary to preserve the fish and game resources. Cooperation between state and federal agencies is very close.

Air Travel Problems Solved

Widespread use of the helicopter has brought with it many problems and many new opportunities for forest recreation. Millions of acres of heretofore inaccessible land, particularly above timberline and subalpine areas, are popular public camp and picnic grounds. The helicopter is an ideal means of access since it leaves no tracks in otherwise wild country and its disturbing influence is strictly temporary. At first, the helicopter brought with it serious fire and pollution dangers, but soon a recreation-conscious public did a good job of keeping track of fire in the back country and leaving clean camps. Helicopters of course are not permitted to land in wilderness areas.

Helicopters have also helped to solve the tremendous demand for summer homes by opening up fine areas, inaccessible by road and not needed for public use. They have also solved many game management problems by distributing the hunters and fishermen and facilitating the reduction of game and the removal of meat from inaccessible locations.

Resorts and organization camps located in attractive forest environments are doing a big vacation business, catering to people who want to be close to forest recreation but want more comforts than can be enjoyed in camps. Many municipalities, organizations, and companies maintain resorts or camps in the forest.

Many resorts and camps are in the back country, accessible only by plane or helicopter. These resorts are a sort of connecting link between the heavily used areas and the wilderness where all travel is

by canoe, horse, or foot. Here people who are not physically able to enjoy wilderness, or do not care to endure the minor hardships of primitive travel, can get a taste of wilderness enjoyment.

Summer Homes Established

Summer homes are very popular in the forest. It has taken very careful planning to locate suitable summer home sites without interfering with the increasing public use of forest lands for recreation. The trend in summer homes is towards groups of 20 to 30 cabins, accessible to good forest recreation country. The conflict with public use has been solved by constructing special roads and airfields, at the expense of the summer home owners, to make new areas accessible for summer homes.

Many tracts of private land inside the boundaries of the national forests and other public areas have been subdivided into summer home tracts and are thus serving their highest use, and their most profitable use. Summer home lots yield a net profit of $50 to $75 per acre per year.

The scarcity of small tracts of forest lands suitable for forest recreation has had an important effect on the use of private forest lands, suitable for recreation. The value of private forest lands for recreation use is fully recognized. Resorts, organization camps, trailer parks, and even public camp and picnic grounds are operating profitably on private forest lands.

The demand for forest recreation has also caused many owners of large tracts of forest land, managed primarily for timber, to practice multiple use. Suitable areas are used for various forms of forest recreation, and the returns far exceed the returns from timber alone.

Roadways Better Planned

A big change has taken place along roadsides, and in road systems. States and the federal government locate roads strictly on the multiple-use principle. The scenic and recreational aspects are fully considered whenever a road passes through forested or mountainous lands. Roads along important streams and lake shores are located to do the least damage to usable recreation tracts and to yield the most pleasing and varied views for the sightseer. The parkway principle is widely used in laying out recreation roads. Roadside zones of 400 feet in width, and much wider in special cases, are acquired and managed as recreation and scenic zones. There are no advertising signs, and facilities needed by the public, such as gas stations, stores, resorts, etc., are placed only in appropriate locations where they can serve public needs without detracting from the forest environment.

Aerial sightseeing by helicopters and light planes is a very popular pastime. Millions fly along the rugged peaks of the Cascades and Sierras, skim over the tree tops, fly low through deep canyons, or follow some water course through beautiful mountain country. This has necessitated a new concept of scenic zones. Many things which did not bother the earth-bound sightseer are now serious eyesores for the air-borne recreational traveler.

Result of Public Action

Charging for recreation areas, closing areas when fully occupied, and rationing wilderness travel were, of course, major issues for many debates in the halls of Congress, at conservation and recreation group meetings and among the public. Americans generally deplored rationing and regulation on principle, as they should, but the incontrovertible fact was that despite the best possible management of the forest recreation resources, there simply were so many people who wanted forest recreation that unrestricted use would have destroyed it for all. Rationing and regulation of use were the only answers.

Charges for recreation were also settled after much debate. Recreation being a necessity for the people, it was argued that it should be provided by general taxation like schools, but the more direct and simpler expedient of charging the users of recreation facilities won out. The license system took only a few years to establish and was accepted by the people as a fair and equitable way to provide the large sums necessary to operate the many areas and facilities needed for forest recreation.

It did not take a recreation-conscious people long to see the folly of overcrowding recreation areas in the forest — that is, after a few popular areas had been thoroughly ruined by overuse and had to be abandoned.

Such is the recreation picture in 2,000. The people have claimed their heritage of forest recreation and no one is going to take it away. Everyone knows that forest recreation is a necessary part of the recreation which people must have to remain healthy and happy in a highly mechanized and urbanized world. Everyone knows that the opportunities for enjoying forest recreation are expensive to plan and maintain, but that the cost is small compared to the public benefits. Everyone knows that forest recreation areas can burn and can be destroyed by misuses, and that the only answer is for everyone to make it his business to see that this does not happen. Everyone knows that forest recreation areas, lakes, and streams are also watersheds — that they may be drinking the water next week which they fish in or picnic near today. Everyone knows that pollution is dangerous and so unnecessary.

Everyone wonders why it took everyone so long to realize what everyone now knows about the importance of forest recreation and the wise management of forest lands.

Range Management Education[1]

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THE TOPIC of "Range Management Education" is of particular interest to me, since I have been engaged in teaching range courses for the past 28 years. During this period of close contact with undergraduate and graduate students, I have endeavored to analyze the strong as well as the weak points of range curricula, the suitability of subject matter, methods of teaching, the value of research in a training program, and the usefulness of the instruction to practicing range managers as well as range land operators.

Broadly considered, range management is the science and the art of procuring sustained forage crops, without jeopardy to other resources or land uses.

This definition presupposes familiarity with the resources and condition of the range; the reference to "sustained" forage use implies the adoption of conservative, rational grazing practices; and the mention of "other resources or land uses" implies due consideration of watersheds, timber, soil, streams, game, recreation sites, and other products of the land.

To carry out an effective program, it becomes clear that the range man must first of all be educated and trained in many selected fields, although he need not be and seldom is highly specialized in any one field.

Need of Range Management Training

Two groups are in need of range management training: (1) the youth, as well as the operator of range land properties; and (2) college or university students who choose to become technical range managers and require professional training.

Vocational training.—Most range lands have long been far below their potential grazing capacity (*1, 11*). The real obstacle to improved range land use lies in our failure to educate the youth and the producer in the elements of range management. This fact has become particularly evident in the present controversy over grazing use of public lands, notably those administered by the U. S. Forest Service, where multiple use of the resources is an established policy and an essential practice. What the stockman fails to comprehend is that some of the other resources of the area are as important, if not of greater local value, than the grass (*7*).

The greatest single need in clarifying proper and coordinated range use is a far-reaching educational program. This should start with the 4-H and similar agricultural clubs, and should be followed up in the grade and high schools. The producer throughout the range country should be informed to the greatest extent possible of improved management practices. Few stockmen know which plants on their ranges provide the best and most reliable seasonal feed, or which ones are poisonous; an even lesser number understand how a range inventory or a management plan is made; or how to judge range condition, or proper standards of range use. Producers are ill-informed because those of us on the front line of action are not going all-out to teach them the simplest principles of range management. To quote Saunderson and Starch (*9*):

> Great and important though the western range resource is, the Western State Land Grant College Extension Service does not, as yet, have an extension service in range management. . . . We do not wish to minimize the extension work now being done in connection with agronomy and animal husbandry. But this should, we believe, be regarded as an interim phase, to be followed as soon as possible by an approach to range management as *range management*.

The range researcher, more perhaps than research workers in some other fields, should be an effective "salesman" of his discoveries. He should be able lucidly to disseminate his findings by the spoken and written word. If it is essential that his findings reach the scientific as well as the lay audience, he should prepare both a technical and a popular article. A producer who is convinced that he may expect bigger returns by adopting a given practice will usually follow the investigator's proposals, and will often persuade his neighbors to do the same.

Professional training.—In the present discussion we are primarily concerned with the men constituting this group, for they will be conducting the future range administration, research, and teaching of range subjects. It is hoped, too, that an ever increasing number of these especially qualified men will join the ranks of the producer and point the way to improved range land use in their communities.

Many educators (*2, 3, 4, 6, 8*) agree that a primary mission of a college education is to train students to think. The ability to think may best be acquired by a combination of formal training in philosophy and logic, with a goodly sprinkling of technical courses. Turner (*10*) has pointed out that a range manager may practice his profession in one of several localities of the range region; therefore he should be trained not only in range management, sociology, economics, and the sciences, but in forestry, watershed management, wildlife management, and perhaps recreation. How may this be done in a four or even in a five year curriculum?

Certainly education does not start with the freshman year in college and end with the senior year. Prior to entering college one may expect the student to have some elementary training in conservation and management of wild lands. In New Brunswick, Canada, elementary forestry and conservation is being taught in the seventh, eighth, and ninth grades (*2*). In the United States few schools below collegiate grade offer a formal course in the conservation of renewable land resources. This situation should be corrected.

[1]Paper presented at a meeting of the Division of Range Management, Society of American Foresters, Washington, D. C. December 15, 1950.

Also, on-the-job training is a responsibility of both the graduate and the employer. Most large industrial concerns, both governmental and private, accept this responsibility. Lee Deen (*3*) was told by a rancher that range managers should have a course in "whittling," that is, a student should acquire good mixing qualities and develop a pleasing personality.

Obviously, the views of anyone who attempts to discuss a curriculum are somewhat colored by his experience with students and by his special subject; so if there is a bit of bias in this discussion it will probably prove to be no exception.

Briefly, the subjects that seem most worthy of pursuit by range majors should include the following:

English—one course composition and one in public speaking.
Botany—general, systematic, plant physiology, and plant ecology.
Genetics—general.
Chemistry—inorganic, organic, and biochemistry.
Mathematics—through trigonometry and biometry.
Physics—sound, light, electricity.
Geology—general course.
Economics—two theoretical courses, one applied.
Sociology—general course.
Philosophy—general courses, including logic.
Zoology—one general course, one economic.
Soils, general— soil-plant relations; soil morphology.
Engineering—topographic surveying and mapping.
Agronomy—general course.
Animal husbandry—nutrition; production; judging.
Range management—summer camp; general; range plants and ecology; techniques and production; economics.
Electives—forestry courses in timber-producing states; courses of special application elsewhere.

Some may insist that students simply do not have the time for adequate training in as many fields of learning as are listed above. That is undoubtedly true, yet properly advised students can avail themselves of many of the courses mentioned; however, the applied courses, such as range management, must be highly concentrated and of minimum units.

The American Society of Range Management has this year formulated a committee which is considering a minimum curriculum in range management. The primary purpose is to stimulate the schools to offer broad, well balanced training, and possibly to induce the Civil Service Commission to adopt the requirements as recommended.

Relatively little time should be devoted to specialization at the undergraduate level; instead the student should spend his time in obtaining good background in the basic natural and social sciences, and especially in English and public speaking. The range (and wild life) manager, fully as much as any other group that attempts to convey ideas to others, should be able to speak and write effectively, as Jeffers (*6*) has so clearly emphasized. Even the simplest ideas should be expressed with the greatest of ease, and this becomes still more important as the ideas grow more complex, as when scientific findings are reported. The range instructor can strengthen the student's training in speaking and writing by calling for term papers which must be well written and which are reported verbally before the class from an outline.

Schools Offering Course in Range Management

To obtain reliable current information on the schools teaching range management, a questionnaire was sent in August 1950 to all institutions known or regarded as likely to offer range training. Thirty-seven schools were canvassed and all replied. Since there are some 600 American colleges and universities with an enrollment of 400 or more students each, it is possible that a few schools offering some range training might have been overlooked in the survey. If this proves the case the author would appreciate being informed in order to amplify the list.

Table I reveals that formal courses in range management of collegiate grade were first set up at various schools in 1915. The University of Idaho, in 1916, introduced the first major in range management. Today 13 western state colleges and universities offer a range major. Colorado A. & M. has two majors, the one in so-called professional range management; the other in grazing management, designed primarily for those who expect to enter the production field. Some 18 additional institutions provide limited training in range subjects. In a few schools that do not have a range major, students can earn the master's degree by pursuing a range problem or passing a comprehensive examination in range and allied subjects. These institutions are: the University of California School of Forestry at Berkeley, and the Division of Agronomy at Davis; Kansas State College; the School of Forestry and Conservation, University of Michigan; and North Dakota Agricultural College. The relative youthfulness of range training is indicated by the fact that 7 of the 13 schools providing range majors have been established since 1940.

With the exception of Iowa State College, these schools are located in the western range country. The grazing resources on the national forests had much to do with their establishment. It is significant, too, that 6 of the 13 schools offering major work in range today require that their students take 12 or more semester hours in forestry. Four of the schools require no forestry and 3 schools require 6 semester hours or less of forestry. This variability in forestry requirements is the chief difference in the range curricula. Where the range work is not organized in the forestry school, it is usually in the department of agronomy, botany, or animal husbandry. The range major schools require from 10 to 28 semester hours of range management. This seemingly wide disparity in range course units is probably not as real as it seems. A course in range plants, for example, may be listed as a range course in one school, but as a botany or agronomy course in others. All these schools appear to require adequate basic training in the plant and animal sciences. But there are differences in the emphasis placed on the plant and the animal phases, depending largely on the location of the institution.

TABLE 1.—INSTITUTIONS OFFERING COURSES IN RANGE MANAGEMENT

Institution	Number range management courses	Year first course offered	Years range curriculum established	Minimum[1] semester hours range courses	Minimum[1] semester hours forestry courses	Number students 1950	Number range management instructors	Graduate work in range
Schools Offering Range Management Courses under a Curriculum								
Abilene Christian College	Several	1948	1950	24	none	25	1	No
Colorado A & M	Several	1916	1936	26	25	58	3	Master's
Idaho, University of	Several	1915	1916	15	21	26	2	Master's
Iowa State College	Several	1926	1937	10	62	15	2	Master's
Montana State University	Several	1915	.....	18	34	40	1	Master's
Montana State College	Several	1938	1941	14	none	20	1	Master's
Nevada, University of	Several	1940	1947	18	none	5	2⅙	Possible
New Mexico A & M	Several	1934	1942	28	none	20	2	No
Oregon State College	Several	1933	1950	10	2	12	1	Master's
Texas A & M	Several	1946	1946	18	6	102	6	Masters; Ph.D.
Utah State College	Several	1919	1927	22	14	100	4	Master's
Washington State College	Several	1919	1922	12	12	12	1	No
Wyoming, University of	Several	1937	1947	16	4	52	4	Masters; Ph.D.
Schools Offering Range Management Courses Without a Range Management Curriculum								
Arizona, University of	Several	1930	.....	.....	.....	.....	.....	Yes
California, University of								
at Berkeley	Several	1920	.....	.....	.....	.....	.....	Yes
at Davis	1	1946	.....	.....	.....	.....	.....	Yes
Calif. Poly. College	Several	1947	.....	.....	.....	.....	.....	No
Georgia, University of	1	1947	.....	.....	.....	.....	.....	No
Kansas State College	Several	1920	.....	.....	.....	.....	.....	Yes
Louisiana State Univ.	1	1944	.....	.....	.....	.....	.....	No
Michigan, University of	1	1933	.....	.....	.....	.....	.....	Yes
Michigan State College	1	1932	.....	.....	.....	.....	.....	No
Minnesota, University of	1	1915	.....	.....	.....	.....	.....	No
Missouri, University of	1	1948	.....	.....	.....	.....	.....	No
Nebraska, University of	Several	?	.....	.....	.....	.....	.....	No
No. Carolina State College	1	1944	.....	.....	.....	.....	.....	No
No. Dakota Agric. College	1	1932	.....	.....	.....	.....	.....	Yes
Oklahoma A & M	Several	?	.....	.....	.....	.....	.....	No
Pennsylvania State College	1	1947	.....	.....	.....	.....	.....	No
Syracuse University	1	1935	.....	.....	.....	.....	.....	No
Washington, University of	1	1937	.....	.....	.....	.....	.....	No
Yale University	1	1946	.....	.....	.....	.....	.....	No

[1]Semester hours or equivalent.

Three of the schools with range curricula do not offer graduate work in this field. On the other hand, at Texas A. & M. and the University of Wyoming, students can do graduate work in range towards the masters and the doctorate.

Of the schools that do not have range management curricula but do offer range courses, some plan to set up curricula in the future. Among these are the University of Arizona and the University of California.

South Dakota A. & M. now offers no training in range management but hopes to do so beginning in 1951. The University of Florida recommends that foresters interested in range management take electives in the Department of Animal Husbandry. The universities of Arizona, Chicago, Minnesota, and Nebraska offer graduate work in ecology, with special emphasis on grasslands, leading to the doctorate.

Employment Opportunities

In building a system of education designed to prepare young men for the profession of range management, the field of employment should be kept clearly in mind.

The primary employment agencies are: (1) The U. S. Forest Service, where the ranks of range administration and range research should be expanded and maintained; (2) the Soil Conservation Service, with its research branch and nation-wide coverage of action programs; (3) such federal agencies as the Bureau of Land Management, the Indian Service, the Bureau of Agricultural Economics, the Bureau of Plant Industry, and some others; (4) state organizations, including the colleges and universities, the agricultural experiment stations, the extension service, and the state division of forestry; a few positions in county and municipal services; (5) private agencies, such as managerial positions on large ranches; appraisers of ranch properties as for banks, insurance, and loan companies; (6) self-employment, such as ranching services and appraisals of private ranch properties.

Conclusions

It is imperative that the range lands of this country, long overgrazed and otherwise abused, be brought back to their potential capacity at a much more rapid rate, on the whole, than at present. To accomplish this, a considerably enlarged personnel of range-trained men should be employed by federal and state land management agencies, and by the agricultural extension service. Also a goodly number of that fraction of the

graduates who have been reared on ranches, should be encouraged to enter into range livestock production; their local rural leadership is sorely needed.

The preparation of an adequate number of young men well grounded in the basic and applied subjects such as those mentioned in this paper, is a highly important responsibility of the range schools. At the present time this responsibility appears to be met about as well as might be expected in a four-year curriculum.

If we will agree that the primary function of range management is that of wise and proper use of the natural grazing lands, then it follows that range-trained men must have received a broad and well balanced education. This fact emphasizes the desirability that all range schools should include the minimum requirements as they are being set up by the American Society of Range Management; but it does not seem necessary—and perhaps it is not desirable—that all schools adopt a full standard curriculum if such were set up. Perhaps it is desirable that schools in different environmental regions place emphasis on different subjects. For example, in forested states like Colorado and Idaho range majors should surely have basic training in forestry, but in Nevada and Texas they might better devote their time to certain other regionally more important subjects.

In many respects our range schools, much as forestry, have grown up through trial and error. But are we really justified, in the light of the training offered, to regard range management as a profession? Are our present training standards sufficiently basic to justify the title—"profession of range management"? I think not.

The question of setting up what could well be regarded as a professional degree in range management, might profitably be deliberated on. Consideration of the question of a five-year curriculum in forestry is not new or strange to this Society; it has received various comments by Society members (*5*).

In many respects range management now stands at the crossroads in its development. More range schools are being organized; more research men are going in for advanced training; more and better qualified men are entering this field of learning. While a fifth year of undergraduate training would clarify many of the knotty problems which now face the schools, this will evidently have to await educational development generally. In the meantime a larger proportion of qualified men should be encouraged, by fellowships and in other ways, to earn the master's degree. A properly organized graduate year should provide, if at all possible, for inclusion of a couple of cultural courses, such as philosophy and sociology, for those who failed to include them in their undergraduate schedule.

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Fifty Years of Forestry Now a College Text

This fall, the School of Forestry, University of California, will begin using *Fifty Years of Forestry in the U.S.A.* as a text in its course, "Forestry 100." The book, prepared by the Society's Committee on History of Forestry, Robert K. Winters, Chairman, reports in 19 chapters by 19 eminent foresters the dynamic story of the growth of forestry technique and practice during the first half of the 20th Century.

Watershed Management and Flood Control Surveys[1]

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THE PAST GENERATION has seen the accelerating growth of two interlocking concepts in the handling of upstream watershed land. One involves the protection of important areas, principally for the control of floods and sedimentation. The other, an even more complicated idea, involves the management of watershed lands for the benefit of all the natural resources on them, with water included as one of the important resources. Until recently these two concepts have been considered largely synonymous. When they are seen from the broad viewpoint of multiple resource management, it becomes evident that watershed protection is only one, however important, phase of the general problem of watershed management.

In the activities of people who are interested in watersheds, the protection phases of watershed management have assumed a very important position (*1, 4*). This role has been especially emphasized by the conduct of flood-control surveys throughout the United States, together with "action programs" which, following the flood-control surveys, are now being applied to a number of watershed areas.

Because of the magnitude of this work, sometimes it tends to obscure the importance of other aspects of watershed management, and the growing interest of land managers in them. Therefore, it is the purpose of this paper to review the background and present progress of flood-control surveys and action programs; to suggest where they may be fitted into a broader program of watershed management; and to comment briefly on recent activities in planning the multiple resource development of large drainage basins, with flood control as one aspect.

Public recognition of the great importance of flood and sediment control in the national picture was put into concrete form through the Flood Control Act of 1936. This act, amended and supplemented a number of times since its original passage, expressed the recognition of the American people that destructive floods form a menace to national welfare. Through its provisions, the Department of the Army is authorized to conduct investigations pointing towards flood control on rivers and other waterways. Correspondingly, the act authorizes the Department of Agriculture to conduct investigations on the watersheds themselves. While the activities of the Department of the Army are pointed mainly at dams and other works in stream channels, the objective of the Department of Agriculture is to reduce damages from flood water and erosion by programs directly applied to the watershed land.

This work consists of alterations in land management and vegetation which will help retard runoff and prevent soil erosion. Wherever necessary, these land-management programs can be supplemented by engineering work. More specifically (*6*), "Watershed programs consist of such measures as the improvement of existing vegetative cover, the establishment of trees or other vegetation on denuded areas, and the protection of forests and grasslands from fire. They include the adoption of the best practices for the management of livestock and big game and of logging and forest-management practices that will maintain a good ground cover. They foster the proper use of close-growing and cover crops on tilled lands and such changes in land use and plant cover as will increase water absorption and retention in the soil and improve the soil storage capacity and crop production.

"Still other measures include such soil- and water-conserving practices as contour cultivation, strip cropping, and supplemental mechanical devices or structures, like terraces, diversion ditches, check dams, small detention dams, and debris basins."

In the Department of Agriculture, these flood-control surveys are conducted by the Forest Service and the Soil Conservation Service, with consultation and assistance by other agencies in the department as needed. After survey reports have been approved and a remedial program is being started, these two agencies are also responsible for supervising and conducting the operations called for by the approved programs. In order to avoid divided responsibility, mutual agreements provide that one or the other agency will assume leadership within each drainage basin.

Aside from work done under the Flood Control Act, land managers have undertaken a number of other activities in the protection and rehabilitation of watersheds. These have invariably been inspired and their direction determined by serious problems of accelerated land depletion, erosion, and floods resulting from misuse of watershed resources (*1*). In Davis County, Utah, for example, serious local floods and devastating mud-flows had developed below areas of steep, deteriorated watershed land. In order to combat this destruction, the Forest Service carried through a costly but highly effective program of watershed terraces, revegetation, and other measures. Since this watershed was controlled, the flood problem below it has been almost entirely eliminated; and the problem area itself is transformed in appearance, with a heavy blanket of vegetation covering the terraces. Another example of watershed restoration and good management is found in the watershed above Centerville, Utah. Years ago the people of this village acquired part of the land in the upper portion of this drainage and

[1]Paper presented at a meeting of the Division of Watershed Management, Society of American Foresters, December 15, 1950.

arranged for conservative grazing use on the whole watershed. It is a conspicuous fact that this area does not produce floods or the destructive mud-rock flows that are characteristic of abused watershed lands in the same general section of the Wasatch Mountains. In other canyons, a satisfactory degree of control has since been provided by the prevention of grazing and fire, together with intensive watershed restoration through revegetation and contour trenching.

Elsewhere throughout the West, land managing agencies are paying more attention to problems of protection and rehabilitation. Contracts for logging on public land include specifications for more satisfactory road construction, for the seeding or other protection of skid trails and roads, and numerous related measures designed to keep the watershed soil in place. Cities, too, are concerned over their watersheds, and are either protecting them from any removal of vegetation or are requiring conservative land use and stringent control of erosion.

All of these surveys and programs have one feature in common: they are designed principally to remedy damages done by past misuse of problem areas, and to prevent or reduce future damages. Thus flood-control programs enter only into areas where appreciable damages have occurred from floods and sedimentation; and even in these areas the program work is justified for its effects in reducing flood peaks and stabilizing the soil. On forest land, for instance, the general aim of a flood-control program is to build up the density of vegetation. This accomplishes several related purposes at once. It makes a thicker canopy of tree crowns and a greater volume of transpiring surfaces, so as to provide maximum consumption of water by interception and transpiration; this means more space for water to be stored in the soil before a flood-producing storm. At the same time, a denser forest means higher infiltration capacities of the forest soil, along with increased organic litter and humus; these factors minimize surface runoff and protect the soil from erosion.

But as work has progressed in these several fields of watershed protection and restoration, it has become increasingly clear that they lack some features that are needed in a well-rounded program of watershed management. First, any program designed to accomplish a single objective may tend to neglect the importance of other resources in the same watershed, and may sometimes overestimate the ability of land owners to adjust their use of other resources in order to help solve the watershed problem. Second, a program set up on a relatively limited area may not make enough allowance for its effects on the economy of adjoining areas. Third, such a program may not properly harmonize conflicts between the needs for increased water supplies and for flood reduction. And finally, any program set up as an immediate remedy for a problem has to work with knowledge that is already available. Therefore it is not likely to make adequate provision for research, to increase knowledge with which future problems can be met.

These lacks in past watershed programs have been recognized for some time (*2, 8*) and various steps are being taken toward their solution. The last two mentioned above are being approached to a considerable extent by research workers in watershed management. Efforts are being made wherever possible to broaden investigations in this field, so as to include the requirements of other resources and the needs of other aspects of watershed management besides protection.

Examples are given by watershed experiments conducted in the Southeast (*5*), Colorado (*7*), and elsewhere, which have shown the possibilities for increasing water yields by the manipulation of forest vegetation. On the Coweeta Experimental Forest in North Carolina, two small watersheds were completely cleared of their hardwood forest, and all the trees and other materials were left as a heavy mat on the ground. With both transportation and evaporation almost entirely inhibited by this artificial treatment, the annual water yields were increased about 65 percent. Smaller increases in yield resulted in another area, where only the riparian vegetation was removed. In the Colorado studies, heavy selective cutting of mature lodgepole pine made about 30 percent more water available for stream flow. This increase was largely the result of reduced interception of snow and rain by the thinner forest canopy; the combined water losses by evaporation and transpiration were not greatly changed. In qualitative terms, similar results are being found in forests of young lodgepole pine and in the spruce-fir type. Incidentally, the Colorado studies are also aimed at harmonizing the practical needs of silviculture and wood production as well as the problems of water yield.

Investigations by the Intermountain Forest and Range Experiment Station in Utah, too, are showing that large quantities of water may be consumed by deep-rooted species in deep soils, and that such losses may be reduced by changing the vegetation to shallower-rooted plants.

An effective approach to remedying the other deficiencies in past programs is being supplied by the development of comprehensive land-management programs by the Department of Agriculture in large river basins. The one now being developed in the Columbia River Basin Area may serve as a good example. Here the general pattern of investigation and program development resembles that employed in flood-control surveys. In fact, flood-control survey crews of the Forest Service and Soil Conservation Service are providing the backbone of work and experience in the preparation of the Columbia River program. But it differs from other surveys in a number of important ways. Instead of being conducted by these two agencies alone, for example, this program is being developed with

leadership by a field committee containing representatives of all agencies in the Department of Agriculture — Agricultural Research Administration, Bureau of Agricultural Economics, Extension Service, Farm Credit Administration, Farmers Home Administration, Forest Service, Production and Marketing Administration, Rural Electrification Administration, and Soil Conservation Service—and the Pacific Northwest Land Grant Institutions.

As a correlated and even more important fact, the program itself is to be pointed at the improved management of all agricultural resources in the Columbia Basin Area. Basically, the program will provide adjustments to bring about the use of land in accordance with its capabilities, economic feasibility, and national needs; improvement of the efficiency of production, marketing, and distribution of agricultural products; and the installation of practices and measures to minimize erosion, retard runoff, conserve and utilize water supplies, stabilize stream channels and minor watersheds, and maintain, rehabilitate, or increase the productive capacity of forest, range, and crop lands. Along with all of this work, the program will include technical assistance and other aids in establishing this program; any credit needed to aid communities, groups, and individuals in their participation in the program; investigations, surveys, and research; a program of education designed to accelerate the adoption of a sound land-management program; extension of electrical and communication services to rural areas; the protection, management, development, and use of federal, state, county, and local government lands; and necessary adjustments in ownership to assure the protection and safe management of lands having important water and other public values which are not safeguarded under existing ownerships.

As a result of these broadened features, the comprehensive programs being developed in this and other great river basins in the United States offer considerable promise of success. From the forester's viewpoint they offer a basis for the integrated management of all the resources entrusted to him —grass, wildlife, and water as well as wood; and they should help him to consider his water problems in broader terms than protection alone.

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Forestry in the Festival of Britain

A view of British forestry is available to visitors during the currently running Festival of Britain (May 3 through September 30) at the forestry section of the South Bank Exhibition, London.

A series of models demonstrate the progress being made in planning and carying out a target objective of 5 million acres of permanent forests to be developed in a 50-year program. The new Snowdonia National Park is shown as a major piece of land-use planning. The floor of the fertile Conway Valley is devoted to farming, the steep hillsides will be forested, the hill tops will be utilized for grazing and for recreation for the people of industrial Midland.

At Culbin Sands in Scotland, a reclamation project is designed to convert drifting sand dunes to forest.

Of the 5 million acres to be forested, 2 million are privately owned.

Some Basic Legal Aspects of Forest Damage Appraisals[1]

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FOR A FORESTER to plan damage investigations most efficiently and better to insure justice to his client, some understanding of the basic legal aspects of his case is essential. Lawyers are often reluctant to discuss the legal aspects of a case with the forester because the latter's inadequate background may obstruct a clear understanding and lead to misconceptions of the issues involved. In such cases the forester is often prevented from suggesting field procedures which would be more adaptable to the case than those which he is advised to carry out by the lawyer. Once the lawyer is shown that the forester's background is sufficient for an understanding of the case, he can more easily be persuaded to discuss fully the issues involved and the legal difficulties to be overcome.

Basic Concepts

The word "law" has many meanings, but as used in this paper it means a rule of human conduct that the state will enforce through its courts (*5*). Among the sources of law in a given state are the United States Constitution, the public acts of Congress, the state constitution, the public acts of the state legislature, the decisions of the United States Supreme and other federal courts, and the decisions of the higher courts of the state.

Much of our law is found in the reported decisions of the higher courts, which also must deal with questions not covered by existing statutes. These decisions may even affect the manner in which the statutes are interpreted. Black (*2*) and Clark (*5*) suggest that court decisions may be designated as *common law* as distinguished from *statutory law*.

When a question confronts a court it will rely on its past decisions in similar situations in seeking a solution to the problem. Should there be no previous decision in that state applicable to the case at hand, then it will turn to the decision of other states or even to those of other countries having the common law system.

Law Relevant to Forest Damage

The categories of law are numerous, but because the interest of a forester dealing with damage appraisals would normally be limited to contracts, trespass, evidence, and damages, this paper is confined to those subjects.

The law of contracts herein treated is limited to that which would be encountered in connection with timber sale agreements. Trespass, which is a subdivision of the law of torts, is discussed from the standpoint of trespass to timberland. Evidence is limited to that which would aid the forester as a witness—either ordinary or expert—and to the material he would likely exhibit in court. The subject of damages is treated in a general manner as basic to an understanding of the remedies for trespass, followed by a discussion of the remedies for breaches of timber sale contracts, and concluded with legal principles of the calculation of the damages discussed under the subjects of trespass and contracts.

Although the four topics listed above have been treated separately for the sake of simplicity of presentation, the fields of law overlap and a clear distinction between them is often difficult. The law of real property is treated in conjunction with contracts and trespass.

Contracts

Pomeroy (*11*) defines a contract as a legally enforceable agreement. From other definitions listed it is doubtful that a concise one can be stated that will fit every case. Contracts are made to refrain from acting in specific ways as well as to perform specified acts.

To be valid, a contract must generally (a) contain one or more promises or offers, (b) be accepted, (c) be based upon a sufficient consideration, (d) have parties with the legal capacity to enter into and comply with the terms of the contract, and (e) not be of a nature which would violate statutes or rules of common law (*19*). Contracts may be written, oral, or even implied. However, Shepherd (*14*) warns that promises reduced to writing, even in cases where writings are required by statute, are not necessarily enforceable.

An offer may be revoked by the offeror at any time before notice of its acceptance by the offeree is made (*7*).

In most jurisdictions severed trees are regarded as personal property, although a few states require that they be bucked up into logs before they are so regarded. While still standing, however, trees are considered as real property (*5*) and as such the transfer of ownership is required by the Statute of Frauds to be in writing (*7*), but ordinarily part performance of a contract for the sale of timber will remove the transaction from this requirement of the Statute of Frauds (*19*). The type of conveyance to be used is specified by statute in some states.

Below is a suggested check list of provisions to be considered when drafting timber sale contracts:

a. Name and address of seller.
b. Name and address of buyer.
c. Date of instrument and place executed.
d. What is bought and sold—species, specifications.
e. Exact location and legal description.
f. Declaration of seller's ownership and right to convey.
g. Conditions governing removal.
h. Provisions for buyer's ingress and egress.
i. Care of other property—fences, roads, fields, young trees, timber not sold, wildlife.
j. Care with fire and slash disposal.
k. Method of measurement—log rule, lumber measure, d.b.h.

[1]From a thesis submitted in partial fulfillment of the requirements for the degree of Master of Forestry in the School of Forestry, Duke University. The author is indebted to Professor A. E. Wackerman and to E. T. Sullivan for their assistance and to C. Frank Griffin, of the Duke Legal Aid Clinic, for reading the manuscript and making valuable suggestions.

l. Place of scaling or measurement.
m. Price and unit of price basis—lump sum, price per M B.F., price per piece.
n. Method and terms of payment.
o. Duration of agreement.
p. Provision for or against renewal option; price of option.
q. Provision for liquidated damages[2] in case of violation of provisions as to size limits, species excluded, and damage to fixtures.
r. Clause for arbitration in case of disagreement.
s. Provision for close utilization and avoidance of waste; height of stumps, maximum top diameters, sizes of lumber to be sawn to prevent excessively thick slabs.
t. Statement of which party is to own the by-products—slabs, tops, sawdust.
u. Provision for or against assignment.
v. Statement of whether it is the buyer's loss or the seller's loss should the timber be destroyed after the execution of the contract.
w. Provision for marking boundaries.
x. Financial responsibility of the buyer; liability insurance to protect the seller.
y. Signatures of the parties; notarial seal.
z. Registration at the court house.

Not all the provisions listed above will be applicable to all timber sale contracts. The provisions required will depend upon the nature of the sale.

Trespass

As defined by Prosser (*13*), trespass may consist of an entry of a person upon the land in the possession of another. It also includes remaining upon another's land or permitting a thing to remain upon it where there is a duty to remove it. Trespass is an injury to the land or to the use of land by one not in possession, while waste is an injury by one in rightful possession (*12*). According to Pomeroy (*11*), there are two elements of trespass: (a) the plaintiff must be in possession of the property and (b) there must be a wrongful violation of and forcible interference with the possession. Mere unauthorized entry upon another's property satisfies this second element.

The possessor of land is not generally held liable for the safety of trespassers so far as his activities and the condition of his property are concerned, but he may be so held if, upon his discovery of the presence of a trespasser, he does not exercise reasonable care for his safety. If the possessor is aware that trespassers frequent certain portions of his land, then he may be held to exercise a reasonable degree of care in his activities. Where trespass by children is foreseeable, a duty to keep the premises in a reasonably safe condition is generally imposed (*13*).

The unauthorized cutting of timber on the land of another, even though the act is unintentional and due to uncertainty of the boundaries, may constitute a trespass (*7*). A person who rightfully enters property and who later misuses or exceeds his authority may be declared a trespasser from the time of his entry. The act of cutting trees of sizes or species reserved in a timber sale agreement may also be declared a trespass.

The penalties for damage in intentional and unintentional trespass cases are governed by statute in most states, and in the former case they range from single or multiple damages to the value of the finished product made from the wood wrongfully removed.

It is not necessary that the plaintiff prove that the act was committed with an unlawful intent, but the trespasser is under the burden of proving his act unintentional (*7*).

Where the plaintiff's trees were wrongfully cut he usually has the choice of suing for the value of the trees as timber or for the reduced value of the property (*9*). In the case where the trees were immature, he is usually allowed the choice of recovery for the damage to the land as a whole or for the value of the trees to the wrongdoer (*5*).

Evidence

Damage must be alleged and proved by the plaintiff and he must show the cause of the damage (*9*). It is the forester's task to prove that damage did or did not occur, to estimate its amount if it did, and to present this information in a manner acceptable to the court. Further, the evidence should be presented in a form that is as simple and as clear as possible in order to be convincing and effective.

A person who possesses experience and technical knowledge on a question before a jury, which is beyond the capacity and understanding of the average juror, may be qualified by the court as an expert witness (*5*). Technically trained foresters are sometimes employed by courts as expert witnesses, but only on cases requiring technical knowledge. Issues involving growth rates or the future effect of fire would require expert testimony, but a forester testifying as an eyewitness to a collision between a lumber truck and an automobile would only be an ordinary witness.

McCormick (*9*) reports that the use of memoranda may be made by the witness while on the stand to refresh his recollection, but that an attempt to introduce the memorandum as evidence in itself will meet difficulty.

Photographs are admissible to illustrate testimony and, in some jurisdictions, as independent photographic witnesses (*6*). They require identification as evidence, and without it they are valueless (*1*).

Aerial photographs may be used to show the extent of a burn (*15*), and the included features such as roads, streams, and buildings, can establish the identity of the area covered. Ground photographs, which generally cover only limited areas, may be identified by inserting some object into the area to be photographed which will positively distinguish that photograph from any other one.

Steigerwaldt (*17*) points out that shadows on bright days tend to distort pictures and reduce detail, and that therefore slightly hazy days should be chosen for photography. Further clarity as to sizes and distance can be attained by including in the photographs objects of known sizes.

Maps, charts, graphs, increment cores, and even sections of tree stems have been successfully used as evidence. Devices such as these, when properly identified and explained, often impress juries much more than do mere descriptions.

[2]Liquidated damages are sums of money agreed upon as payment for specified violations where these sums are pre-estimates of the expected losses.

Damages

General considerations.—"Damage" denotes the injury that was sustained by the property, and "damages" means the amount of money claimed or awarded as compensation for the injury or loss (*5* and *9*). Types of damages which can be awarded are:

a. "Substantial" damages are those awarded as compensation for the injury or loss.

b. "Nominal" damages are those awarded, not as compensation for the injury or loss, but in a very small amount as recognition of the wrong. The recovery of nominal damages for trespass, in addition to the personal satisfaction the plaintiff may feel for proving that he was right, may have the very practical result of stopping the defendant's time that was running on adverse possession (*9*).

c. "Exemplary" or "punitive" damages are those awarded the plaintiff in addition to substantial damages. They are levied against the wrongdoer as punishment for evil or fraudulent motive (*13*). All but a few states sometimes award exemplary damages. The awarding of these damages in cases of malicious wrongs is left to the discretion of the jury, and their recovery is not considered a right. The jury, in such cases, decides whether they shall be awarded at all, and if so, what the amount shall be (*9*).

Damages for breach of contract.—The purpose of damages for breach of contract should be to place the plaintiff in the position, so far as money can do so, that he would occupy had the contract been fully performed (*9*). However, the doctrine of Hadley v. Buxendale, 9 Exch. 341 (1854), limits the damages to only those losses which could have been reasonably foreseeable at the time the contract was made. For this reason, and because of the further restriction imposed by many courts that the defendant agreed—either expressly or impliedly—to be liable for the loss in question, it is important that a stipulation of which party is to bear the consequences of accidental timber destruction be incorporated into the contract.

A sum of money agreed upon in a contract as payment for specified violations as an estimate of the value of anticipated injuries is termed "liquidated damages," and as such, is enforceable. However, where the sum is not a pre-estimate of the possible injury, but is provided to act as punishment for the anticipated violation and to prevent such breaches, it is termed a "penalty" regardless of the language of the contract, and is not enforceable (*9*). Therefore, the stipulated sum should be commensurate with the loss anticipated and adjustable to fit the probable damage.

If the plaintiff, in a suit for damages for breach of contract, can establish what his net profit would have been with full performance, he can recover it.

Calculation of damages.—The value of a specified piece of property may be proved by the opinions of either ordinary or expert witnesses who are familiar with such values, and it may also be proved by the price paid for the property (*16*). Some jurisdictions, in the case of partial loss or partial destruction, will accept opinion as to the value of the loss; others insist on the opinion of the value of the property before the loss and the value after it (*9*). Market value, the amount for which the property could be leisurely sold to a willing buyer, is the normal standard used in assessing damages, and the market value of the property as a whole is the one so used.

The highest price which the plaintiff could have reasonably obtained for the thing damaged or lost is the one to be determined. Thus, if the defendant mistakenly cut the plaintiff's trees and converted them to pulpwood, the plaintiff could logically sue for their value as sawtimber if trees of that size and species were normally utilized in that vicinity and under the market conditions then prevailing.

Where immature trees have been killed by fire, the value is determined variously in different jurisdictions. Some courts require the loss to be shown by the reduced value of the land; others regard the value of the trees at the time of their destruction to be the measure of damages. In the case of Williams v. Elm City Lumber Co., 154 N.C. 306, 75 S.E. 631 (1911), the prospective value of immature trees cut was allowed to be shown as bearing on the reduced value of the land.

It is the plaintiff's duty to reduce the damage resulting from the defendant's act if it is reasonably within his power to do so. Thus, if fire should escape from a neighbor's property and kill some of the plaintiff's trees, as much of the dead timber as possible should be salvaged to reduce the loss before deterioration by insects and fungi occurs. In attempting to so reduce the amount of damage or loss, the plaintiff is entitled to recover the reasonably incurred expense of the operation. If the defendant's wrong results in a benefit to the plaintiff, then the value of that benefit must be deducted from the damage in calculating the amount of recovery (*5*).

In a repudiated contract to cut and haul timber, the usual rule is to limit the plaintiff to the "present worth" of anticipated profits. An orthodox practice in determining what these profits would have been is to use the past profits of a similarly established business as evidence, but not necessarily as a measure of them (*8*).

Most courts take a dim view of compound interest, and it is only in *exceptional* circumstances that they will use it in valuing damages (*9*). The rate of simple interest used in the calculation of damages is generally the legal rate of that jurisdiction as determined by statute, although there have been cases where lower rates have been applied, particularly where such lower rates had been previously agreed upon in the contracts involved.

Thomson (*18*) explains present worth as being an estimate of a future value discounted back to the present. Chapman and Meyer (*4*) and Mitchell (*10*) list present worth—or "expectation value"—as the usual basis for appraising immature and other timber having no present demand or value. Kinney (*7*) states that damage to trees

not large enough to have stumpage value may be assessed on an investment basis in some jurisdictions.

A method of computing present worth which has had the sanction of some courts (*9*) is by the formula

$$V_o = \frac{V_n}{V_n + (V_n \times p \times n)} \cdot (V_n)$$

where V_o=present worth
V_n=estimated future value
p=rate of interest expressed in decimal form
n=number of years in the future upon which the estimate is based

The orthodox simple discount formula,

$$V_o = \frac{V_n}{1 + (p \times n)},$$

found in standard textbooks on forest economics (*3* and *4*), will of course yield the same results.

Conclusion

The material herein presented is not purported to be a complete treatment of the legal aspects of forest damage appraisals. There are many other phases of the subjects touched on here that are of no particular interest to the forester but with which the lawyer must constantly deal. The forester should bear in mind that the law will vary from one jurisdiction to another and that it is also constantly undergoing modification.

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Harry P. Brown (1887-1951)

Dr. Harry Philip Brown of Syracuse, N. Y., professor and head of the Department of Wood Technology at the College of Forestry, died suddenly on May 24 while at work. His age was 64 years.

A graduate of Cornell University, he received the B.A. degree in 1909, the M.A. degree in 1910, and the Ph.D. degree in 1914. During his university career he studied various forestry subjects, with a major in dendrology for his doctorate.

In 1910 he was appointed as xylotomist in the U. S. Forest Service at Washington, D. C., but returned to Cornell a year later under appointment as instructor in dendrology and wood technology. In 1914 he went to the New York State College of Forestry, at first as assistant professor of botany until 1917, thereafter as professor of wood technology, a post

HARRY P. BROWN

he held with distinction until his untimely death.

In 1924 Dr. Brown went to India to engage in a taxonomic survey of Indian woods at the Forest Research Institute at Dehra Dun.

His contributions to the literature of wood technology were numerous and scholarly. One of his best known works was *Identification of the Commercial Timbers of the United States* of which he was co-author with A. J. Panchin. This book was subsequently rewritten by these authors together with C. C. Forsaith as *Wood Technology*, published by McGraw-Hill as one of its notable American Forestry Series.

A member of the Society of American Foresters since 1921, he was chairman of the New York Section in 1932-1934. Dr. Brown was also affiliated with numerous other professional and scientific organizations, including the American Association for the Advancement of Science of which he was a Fellow, and the Botanical Society of America.

He is survived by his wife, Helen K. Brown, a son, and two daughters. His home was in Syracuse, N. Y., at 130 Buckingham Avenue.

An Economical Method of Marking Timber[1]

W. S. Bromley
Forest engineer, American Pulpwood Association.

TOO MANY FORESTERS in this country feel that a tally must be kept of every tree marked for cutting or to be left, or both, whenever timber is marked for removal from forest stands. As a result of this attitude, trees are recorded on a 100 percent tally basis on sheets which are rarely summarized and studied until after the timber concerned is cut.

I recall noting some years ago in one forester's office a pile of marking tally sheets more than a foot high that had not been summarized at all. When I asked the question as to when these sheets would be tabulated I was told that this was a rainy weather job which never seemed to get done because there wasn't enough bad weather to keep the timber markers in to do the work. The result was that instead of the tally sheets being used as a daily or weekly guide to control the marking, they represented a pile of unfinished work which provided absolutely no information of value in guiding and controlling the marking operation.

Any forester who lets a situation of this type develop on operations over which he has control is not fulfilling his full responsibility to his employer and the profession of forestry. In fact, the forester who gives his marking crews adequate training and then permits his timber markers to mark trees without any tallying at all is, in a sense, doing a better job because he is not wasting any time or money recording a tally of trees which is not used.

Many foresters might be inclined to disagree with me on the point of no tallying at all, but I would like to point out that during World War II, I supervised the timber marking in northern hardwood-hemlock sawtimber for from 30 to 40 million board feet per year and no tally was ever taken of the timber marking except during the training periods of new men. Our only control of the marking in this case was an occasional periodic check made by me or the district supervisor as we reviewed current marking or as the residual stands were cruised after the selective cutting operation was completed. It is my belief that it is better to do no tallying at all during the timber marking operation than to take tally and not use the information you are obtaining.

For the benefit of those foresters who feel that it is absolutely essential that a tally be made of the trees being marked for "cutting" or "leaving" as the case may be, I would suggest that any tallying system which is designed to accompany and guide the timber marking operation should be computed and analyzed within a week of the actual marking operation. No doubt there are several methods already in use which would meet this requirement. One merely provides for a tallying of every tenth tree marked, or for every tenth tree in the stand regardless of whether it is "cut" or "left." The end result of such a system, of course, provides for a 10 percent tally of the marking or of the entire stand depending on whichever practice is being followed. If this information is computed and analyzed either daily or weekly, I would have no arguments against it. It seems a very practical and sensible way of keeping track of the timber marking operation.

In the past year I have worked with Willard Ruch, director of the Phillips Brook Conservation Project, of the International Paper Company, in developing a procedure for keeping records of the timber marking operation which, I feel, provides for a very practical and sensible control of this activity. This method is described in some detail as follows.

Office Preparation

1. Before each compartment in the project area and where possible before each stand within the compartment of a different tree species composition is marked, consideration should be given to application of the prescribed marking rules to each stand area.

2. The basis of this consideration shall be such stand tables for the compartment or sub-compartments of the individual stands as may be available.

3. If time and funds available permit, a pre-cutting cruise should be made before marking if existing records are inadequate.

4. After the stand table for each stand is analyzed, instruction notes for the field use of timber markers should be made as to the approximate total number of trees per acre to be removed in accordance with the policies of the forest management plan or policy statement covering the forest concerned. These notes should include the following information:

A. Compartment
B. Stand location
C. Acres
D. Forest type
E. Size and age class
F. Approximate composition of "cut" per acre
   (1) Species _____
   (2) Number _____
   (3) Flexible diameter limit _____
G. Special notes on marking to be done

Control of Marking by Area

1. Some form of base line should be used or established temporarily for each day's marking to keep the timber marker oriented and to enable him to sketch a map of the area being marked.

2. Along the base line the marker should pace off one chain (66 feet) and then pace off at right angles to the base another chain distance. In this way he would have before him the first 1/10 acre of the area to be marked.

3. By noting the timber type and individual trees on this 1/10 acre and referring to the specific marking notes prepared in the office, the marker can determine which trees should be marked according to the instruction notes and still comply with the policy outlined in the marking rules for the forest in general.

4. Using a 1/10 acre unit of

[1]Presented at a meeting of the Division of Silviculture, Society of American Foresters, Washington, D. C., December 13, 1950.

area in marking makes it easy to reduce the recommended cut as to number of trees. If this is too large a unit, a 1/40 acre unit may be more practical and obtained by pacing off two sides, one-half chain (or 33 feet) of the square unit to be covered in marking.

5. Whatever unit of area is used, it is observed on the ground with sufficient care so that the marker knows at all times where he is in the stand. In this way he can keep up a map of the area being marked as he proceeds.

Marking Individual Trees

1. All trees to be cut shall be stump marked below the point where felling cut is to be made and marked at breast height (4½ feet from ground). Blazes made with the axe should remove all of the bark for an area at least the size of the palm of one's hand.

2. Each of the two axe blazes shall be stamped with a brand to indicate the official designation of the company's decision to cut the tree.

3. If paint marking is used. it will be necessary to show two spots of paint of the same size and at the same position on the tree, but no bark need be removed.

4. Blazes should ordinarily face the direction which can most readily be seen by the cutters and still facilitate the marking and later inspection of cutting operations.

Field Record of Marking

1. Each timber marker (or one of a crew of two or more) should keep a map of the marking as it progresses and this must be maintained currently throughout each day of marking.

2. Each man marking timber should keep a current record of the number of trees marked on a small card or notebook with the following information:

Current Marking Record

Compartment ..... Sub-compartment ..... Stand .....

Marking strip number	Spruce	Fir	Pine	Y. Birch	Maple	Others	Acres
1							
2							
3, etc.							

3. During the day each marker should total his trees and area marked to see if he is keeping within reasonable limitations of the specific marking notes set up for the stand concerned.

4. At the end of each day the results should be summarized.

5. When the week's marking is done, or when a specific stand or sub-compartment has been marked, the daily totals can be added together.

Check and Volume Summary

1. At the close of each week or other logical period of time not exceeding two weeks, a field check and volume summary of the marking should be made.

2. This should cover at least 5 percent of the marking and should be made by cruising on a "cut" and "leave" basis with quarter-acre plots chosen at random.

3. The periodic cruise of marking will develop an average volume per tree by species for each period that should give a representative sample of the average volume of the trees marked for that period. This is obtained, of course, by dividing the total volume of the trees tallied in the cruise by the total number of trees making up that tally.

4. The multiplication of the average volume per tree of each species by the total number of trees marked for the week or other period of marking should give a very reliable estimate of the total volume marked for that week or period.

5. The check cruise will, of course, also develop the approximate percentage of cut which is marked for the week period or the area being checked.

Application

When the procedure described above was carried out on the timber marking operations of the Phillips Brook Conservation Project, it was found that marking costs were reduced from 30 to 40 percent from those resulting when the tallyman was kept employed on a full-time basis to keep a record of the trees marked "cut" and "leave." In addition to reducing the costs of timber marking as a whole, the quality of the work improved because a weekly check on the compliance of the timber markers with marking rules which had been provided to them was made possible under the procedure recommended.

This method of marking timber is applicable, of course, regardless of whether the marking axe or spray gun is used in the marking operation. For any forester who is looking for a sensible and economical method of marking the timber and still maintaining the necessary silvicultural and administrative control over the work, I sincerely recommend that a trial be given to this procedure.

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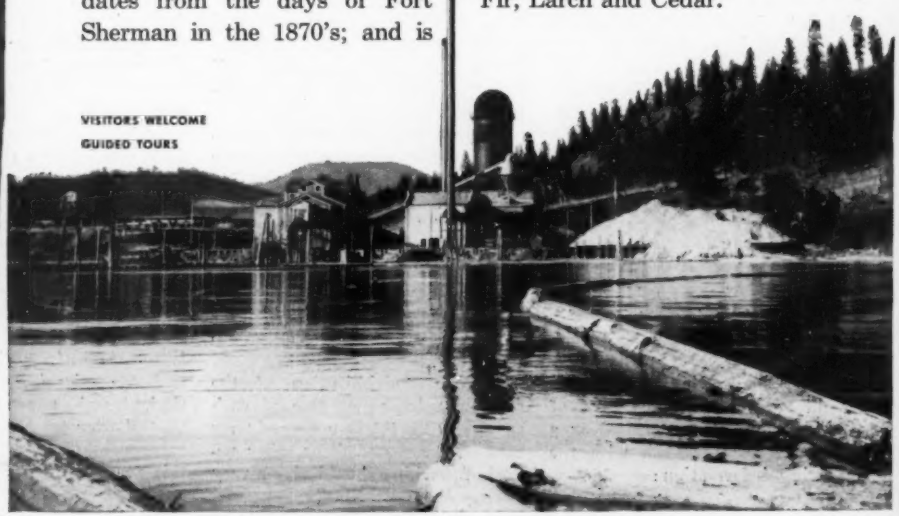

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Notes

Damage to Trees by Black Bears in Alaska

During the summer of 1949, while engaged in field work for the Alaska Forest Research Center, the author repeatedly encountered a spectacular type of damage to trees in the forests of the lowlands on the Kenai Peninsula, Alaska. Occasional tracks and other signs beside the injured trees led to the conclusion that the Kenai black bear (*Euarctos americanus perniger*) was responsible, an opinion concurred in by long-time residents of the region. The population of black bears on the Kenai Peninsula is very high. A brief examination of the literature led to the view that the type of damage involved may not be of wide geographic occurrence nor generally understood, so this note was prepared.

The damage consists of stripping the bark from the basal portion of the trees. Occasionally the stripping completely girdles a tree but more commonly the girdling is only partial. The bear tears pieces of bark loose at the root collar, either with teeth or claws, and then strips them upward. Sometimes the strips of bark, usually 4 to 6 inches wide, are torn completely from the tree but more characteristically they are left attached above. Trees are seen on which all the bark at the base has been frilled in this manner. Most commonly the stripping extends to a point 2 to 3 feet above ground, but occasionally it may extend to a height of 7 or 8 feet. In all cases noted the bark was first loosened at the base, around the root collar, and then stripped upward. The exposed wood usually shows shallow grooves, made either with the teeth or claws.

White spruce [*Picea glauca* (Moench) Voss] is the species most commonly injured but aspen (*Populus tremuloides* Michx.) is also damaged. Medium-sized trees, 10 to 18 inches in diameter, are most frequently selected. A preference is also shown for "sappy" spruce trees of rapid growth and relatively smooth, thin bark. Thick barked, slowly growing, "dry" spruce trees are not as likely to be damaged. The work is done in the spring and early summer when the bark strips off readily.

In the white spruce type the number of trees stripped by bears is often 10 to 20 per acre and locally may be much higher. Unfortunately, the most promising trees are often the ones which are damaged. Stripped trees are not restricted to locations adjacent to trails; seemingly they occur at random.

Moore (*1*) reports a somewhat similar type of damage to young Douglas-fir (*Pseudotsuga taxifolia* Britt.) trees on Mount Hebo, Ore. The black bear (*Euarctos americanus altifrontalis*) was charged with the damage. Moore noted that the exposed wood was grooved ". . . apparently with the lower incisors."

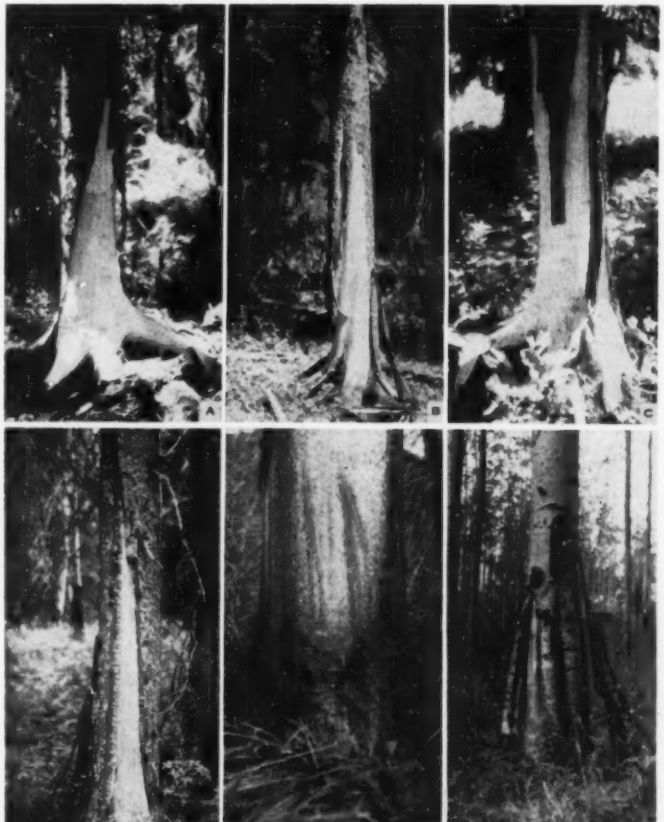

FIG. 1.—Injury to trees caused by black bears, Kenai Lowlands, Kenai Peninsula, Alaska. *A.*—White spruce 13 inches d.b.h. stripped to a height of 5 feet. *B.*—White spruce 14 inches d.b.h. stripped to a height of 7.5 feet. *C.*—White spruce 13 inches d.b.h. stripped to a height of 6 feet. *D.*—White spruce 12 inches d.b.h. stripped to a height of 7 feet some years ago. *E.*—Aspen 12 inches d.b.h. showing tooth marks on exposed wood. *F.*—Aspen 11 inches d.b.h. with bark frilled to a height of 3 feet.

Ray (*2*) mentioned that bears have done considerable damage to balsam fir, in the Lake Edward area of Quebec, Canada, and pointed out that unfortunately they choose only the best, fastest growing trees. He wrote, "On one sample-plot where growth had been greatly stimulated as a result of girdling hardwoods, the loss caused by bears alone was over 90 percent of the balsam fir; at the same time very slight damage was done on adjacent ungirdled plots where the rate of growth had not been so stimulated."

As this note was being prepared the attention of the writer was directed to the work of a "Bear Facts Committee" of the North Olympic Chapter, Society of American Foresters. Damage to coniferous reproduction in western Washington has become so serious that a solution of the problem is now being sought.

Seton (*3*) discussed at some length the habits of black bears and has noted that they frequently scratch and bite trees. Trees so treated have been regarded by biologists as "measuring trees," "bear registers," or "signboards." Seton held that they were . . . "methods of communicating certain information to bears." The injuries sustained by "measuring trees" are usually located well above the ground, as high as the bears can reach, standing on their hind legs. The damage results from biting or tearing the bark rather than from stripping it upward. Further, "measuring trees" are usually (Seton says "always") found along well-worn bear trails and they record repeated injuries. In all these respects the damage reported by Seton differs from that observed in the Kenai lowlands.

Why bears strip the bark from trees as has been described in this note is a matter of conjecture. It may be suggested, however, that they derive some benefit from the sweetish sap and the thin layer of soft tissue from the cambial region which adheres to the exposed wood. Other animals, presumably rodents such as mice and red squirrels, are attracted to the wood surfaces exposed after bears have stripped the bark. Teeth marks of these small animals have been found literally covering such surfaces. Indians are credited with the remark that the food of the black bear "is the same as a man"; it is a well-known fact that Alaskan Indians used the tissues from the cambial region of trees as food during times of want.

A. W. Moore, in personal correspondence with the writer, suggests that the stripping of bark from trees by bears is an acquired trait; black bears are imitative and, seeing bark stripped from trees, acquire the habit. He doubts that the action results from a deficiency of food, pointing out that although bears, notably omnivorous, are plentiful throughout the Douglas-fir region, damage is localized in spite of the existence of vast areas of second-growth 10 to 30 years old.

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H. J. LUTZ,

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Forestry in the Long-Term Trends of FAO

Recommendations of the United States government on the long-term activities of the Food and Agriculture Organization of the United Nations were presented to FAO this spring by the Secretary of State. The recommendations for forestry, reprinted below, were part of an over-all statement on agriculture, nutrition, rural welfare, economics, statistics, distribution, fisheries, and forestry.

Forestry

In their comments on the Program of Work in Forestry for 1950, and again in connection with the program for 1951, United States representatives expressed regret that the program fails to implement more fully the basic concepts originally affirmed by the Forestry Committee of the Interim Commission, and re-affirmed by subsequent FAO conferences. There are indications of a growing imbalance in the annual programs—a lessening of weight on the more fundamental, long-term problem of conservatively *developing the world's forest resources* in harmony with sound forestry principles, and an apparent increase in servicing the more immediate and short-term requests of member countries, particularly of the more articulate countries and for services related to the manufacture and marketing of forest products. We recognize that there is a great demand for assistance of the latter type, but we believe a better balance between short-term services and more fundamental long-term activities must be attained.

We believe that FAO should place major emphasis, *first*, on encouraging and *extending expert advice to the so-called underdeveloped member countries*, both those possessing large, unexploited forest resources and those whose forests either have been destroyed or which approach exhaustion and are now in need of replenishment; *second*, on those activities directly contributing to the *conservative management and use of forests*, their protection and rational development, their restoration following depletion or deterioration, their creation where land now idle is best suited to such use, and on such other activities as will serve to maintain and enlarge the forest wherever needed either for its protective influences or as a source of products.

The current FAO program is unfortunately weighted in the direction of aid to highly developed

countries, such as those in Europe, rather than those industrially less advanced, and on the development of forest-products industries and forest products generally, in contrast to the forest itself. We appreciate that the former countries are more aware of their needs and more capable of expressing them effectively and that many projects in the field of forest products may favorably influence the practice of forestry. *The underdeveloped countries*, having large bodies of timber and little or no industry, will of course, *desire to encourage industrial development of their forest resources*. They will require technical assistance in making economic surveys, in the application of modern logging methods, in the establishment of various forest-products industries, etc., so that they may properly guide those who might engage in their development. But, at the same time, emphasis should be put on the means for assuring proper conservation and management of the forest.

We hold no brief for the contention that the adoption of a program of forest conservation must be preceded by a period of forest-industry development and unregulated forest exploitation in order to establish a profitable outlet for forest products and demonstrate the practicability of forestry. Too often, this approach has resulted in the indefinite continuation of destructive cutting, postponement of effective public controls over forest exploitation, and eventual exhaustion of the forest resource.

It should be clearly recognized that the necessary foundation for the rational development of the forest resources of a country can be laid down only through governmental action supported by appropriate forest policies and laws, *an efficient public forestry organization*, and adequate funds. Many years of public education in the values of forestry, the training of native technicians, and the conduct of research to determine suitable forest-management and silvicultural policies and practices will often be required as a preliminary step. By encouraging and assisting member countries to establish the machinery within the country itself to do the work that needs to be done—in education, training, research, etc.—FAO will be doing what no other agency is fitted or prepared to do. On the other hand, such undertakings as the development of efficient plants using basic forest materials, the reduction of manufacturing waste, the discovery of new products, the improvement of equipment, etc., will go forward in many cases under the leadership of private industry.

In accord with the above views, we look with favor on the work projected in the FAO program for 1951 under the headings of "*forest policy*" and "*silviculture*," particularly the studies on forest policy, laws, and administration; the promotion of extension work; the training and education of forestry technicians; the conservation and restoration of soils and the stabilization of water supplies; afforestation; and protection against fires, insect pests, and diseases.

We strongly urge greater support for projects which will promote the *restoration of forests* and the conservation of the few remaining forest resources *in the Near and Middle East*—one of the world's major problem areas.

Similarly, we favor the kind of projects falling under the heading of "economics," including the planning of forestry inventories, publication of the *Yearbook of Forest Products Statistics*, the periodic re-appraisals of world production and consumption of forest products, and, in general, more accurate statistics, thereby furnishing a better guide to FAO and agencies of the member countries in devising appropriate measures for dealing with world forestry problems.

We would support the expansion of "*regional activities*" to advance the type of program referred to above as worthy of greater emphasis, thereby bringing FAO experts into closer and more continuous touch with local problems and people, and enhancing the prospects of earlier and more effective assistance, especially to the underdeveloped countries. Regional staffs can provide valuable aid in formulating technical assistance requests and in guiding missions and technicians working in the field.

Regional activities in the current program appear heavily overbalanced in favor of the more developed regions. In view of the much greater need for assistance elsewhere in the world, associated with extremely acute shortages of forest products in some areas and large, underdeveloped forest resources in others, regional activities should be increased in such areas and correspondingly reduced in Europe as rapidly as these countries can assume more complete responsibility for these activities. Specifically, we suggest that the forestry staff be strengthened to assist Latin America and the Far East to the point where the services FAO can render are more commensurate with the magnitude of the problems and the number of people involved.

As a means of correcting the present imbalance in the direction of activities in the field of forest products, we would advise *a reduction in studies of manufacturing techniques*, logging and milling equipment design and procurement, advisability and location of new plant capacity, and similar studies, in the case of all member countries where private industry, associations of the timber trade, and other established public or private facilities are able to sponsor such activities.

In making these suggestions for the future guidance of the Director General, we do not wish to appear unduly critical of the past work of the FAO Division of Forestry and Forest Products, nor to recommend discrimination against any region. We have attempted, rather, to direct attention to the need for a better balanced program, for a shift of emphasis, believing that in the long run the objectives of FAO will be thereby more fully attained.

Points of View

Ponderosa Pine Monograph Criticized by Chapman

It may be said that Pearson's investigations on ponderosa pine[1] constitute the only instance in which a single investigator has had the opportunity to devote his entire professional life to research on a single species, and one of outstanding importance over an immense area in the western states. Cautious, patient, methodical, and always open-minded, he reserved judgment on many points until he had thoroughly tested the evidence and eliminated doubtful factors. He was greatly aided throughout his work begun in 1908 and continued for 40 years until his death in 1948, by the establishment at Fort Valley, Arizona, and elsewhere on the Coconino National Forest and in New Mexico of the first adequate series of permanent sample plots in the national forests whose records have been kept since their establishment. With a species whose reproduction takes from 10 to 20 years to reach a height of 5 to 6 feet, and whose life span and rotation is not less than 160 years, time is an indispensable element in determining results, and continuity of personnel in charge greatly increases the progress made in their interpretations and application. It is to be regretted that he did not live to see the final publication of forty years of consistent effort to solve the problems of management for ponderosa pine.

To comment on the contents of the bulletin in detail would require more space than is permitted, hence the writer will concentrate on one phase of the monograph which his intimate personal acquaintance with the author and subject leads him to believe that Pearson would have desired.

In the section on control of damage by browsing animals (pp. 157-161) it is evident that the author, Pearson, did not have the last word. The studies by Cooperrider and Cassidy (1926-1935) were conducted on the premise that browsing by cattle and sheep was instigated by thirst, and that its control could be effected by supplying adequate water. Statements to this effect were released during the extensive experiment intended to establish this fact. Pearson denied this and claimed that the evidence gathered did not prove the case. The final report on this experiment was never published, but the presumptions, gathered from unpublished typewritten reports, appear in this bulletin to the effect that browsing of shoots "became heaviest in late June and early July when the weather was hot, and when stock waters were few" and "Browsing by cattle ceased under damp conditions and during and following rains." The conclusion was that "shoot browsing by cattle occurred mainly under dry conditions, and this fact furnishes the basis for the development of range management practices that will minimize the damage to reproduction."

As a general review of research investigations these statements have a place, but since the bulletin appears under Pearson's name, and all his findings and statements categorically and vigorously denied these assertions, it is advisable to emphasize this fact. Pearson even went so far as to declare that if this report was published he would be compelled to expose its fallacies.

His own contention, which follows, in the text, is that shoot grazing occurs only when the new growth is still tender, and ceases after about June 15 when it becomes tough and fibrous, thus attributing the damage to search for food and not water. Since drought of equal severity occurs after the summer rains, with no shoot damage, and since the controlled experiment, according to Pearson, did not show statistical proof of correlation between water supply and shoot grazing, it is unfortunate that this apparent error in deduction should appear in a bulletin intended to sum up his findings. The writer got this information at first hand from Pearson, while examining the plots in question, and from later correspondence on the subject with him.

In another respect, this bulletin does not fully portray Pearson's research on the matter of grazing damage to pine reproduction. His first publication, not cited in the references is *Reproduction of Western Yellow Pine in the Southwest*, Forest Service Circular 174, 1910, 16 pp., in which he shows the evidences of grazing damage by sheep. He states, "Sheep severely injure seedlings by browsing and to a lesser extent by trampling, and they should therefore be excluded from areas in which reproduction is desired. Horses and cattle do but little damage and their exclusion is unnecessary."

Following this publication, the Grazing Branch in District 3 took over the research on browsing damage, resulting in the publication by R. R. Hill in 1917 of investigations conducted in 1912 and 1914 (Reference 27). During this period no effort had been made to regulate grazing, and large increases were permitted as a war measure accentuating the damage.

In 1917 the writer as chief of forest management in District 3 was responsible for a quantitative evaluation of this damage, conducted by Marinus Westveld. This report (not mentioned in references) resulted first in an extensive fencing program and finally, aided by economic conditions, secured adequate reductions of numbers of sheep on the worst damaged allotments, between 1926 and 1929 as the bulletin states. This was the first widespread and effective effort to control browsing damage in the ponderosa pine type on the national forests. For this result, District Forester Frank Pooler and Chief Forester William B. Greeley

[1]Pearson, G. A. Management of ponderosa pine in the Southwest. 218 pp. Illus. Agriculture Monograph No. 6, Forest Service, U. S. Department of Agriculture. 1950. (Reviewed in the May 1951 issue of the Journal of Forestry, page 374.)

are responsible. The establishment of an enormous crop of pine seedlings in the season of 1919 enabled large quantities of these seedlings to survive during the initial danger, in the first season when most of the destruction by sheep occurs, and then to recover from later browsing after the stock numbers had been reduced. The important phase of this historic episode is that the pressure for reductions did not come from the Branch of Grazing even after its researchers had confirmed Pearson's findings of 1910, but from Forest Management, through the coordinating influence of those at the top, who were responsible for the complete program. The later investigations of the grazing branch, in water versus browsing previously noted here, portray the danger of endeavoring to prove a preconceived notion instead of keeping an open mind as to all the influences concerned in a research problem.

With the exception of this topic of grazing, the remainder of the bulletin can be said to reflect in all respects the findings of Pearson.

H. H. CHAPMAN.

Forest Service Defends Pine Monograph

Reference is made to H. H. Chapman's comments on *Management of Ponderosa Pine in the Southwest*, by G. A. Pearson.

As a background of our views upon which Professor Chapman comments, I believe it would be well for me to outline, first, the policy of the Branch of Research of the U. S. Forest Service, with respect to publication of the results of major regional studies such as is reported by the bulletin in question.

A paramount consideration behind this policy is that Forest Service research is an investment of public funds. The sample plots, the data, and the interpretations thereof fundamentally then are neither the property nor do they constitute prerogatives of any individual, although the major contributor who has headed up the project is recognized as the author or the senior author of the final publication. In order to make sure that research of regional import is comprehensive and regional in character and to assure that as comprehensive consideration of the results of the research as possible is made, we have for many years used a very critical screening and review process.

For publications to be printed at federal expense, my office is responsible for securing such reviews in the field of forest management research, correlating the ideas of the reviewers, transmitting these to the author through the director of his experiment station, and assuring that the author and the station satisfactorily answer the criticisms of the reviewers which appear valid. In the case of *Management of Ponderosa Pine in the Southwest* a formal review board, consisting of F. H. Eyre and C. F. Korstian, gave the manuscript thorough and careful consideration. Additional reviews in their particular subject matter fields were obtained from the Washington office Divisions of Timber Management, Range Management, Wildlife Management, and Range Research. Further reviews were obtained from specialists engaged in research on the management of ponderosa pine. The results of these reviews were carefully considered in my office, correlated, and transmitted with our recommendations to the Southwestern Station and the author. Pearson was engaged in the final revision of his manuscript at the time of his death.

The job of completing revision of the manuscript for publication was assigned to George S. Meagher. His task was difficult and arduous and he has, and doubtless will, receive scant recognition of the contribution which he made to it. I am unable to escape a feeling of resentment at Professor Chapman's characterization in his March 7 letter of Meagher as a "ghost writer," when it was primarily he who made possible completion of the manuscript for publication.

We are pleased, of course, that Chapman apparently finds the bulletin adequate except for a rather minor phase of the overall study. Further, this is a phase which, although extremely controversial in former years, has become considerably less so as knowledge of both range management and forest management in the Southwest progressed. In such cases it is customary to include the results of pertinent research other than that of the author to give the reader as comprehensive a picture of results to date as the status of knowledge permits. In reply to the specific point in question, the Division of Range Research in this office has the following to say:

> It is unfortunate that a man of Professor Chapman's standing takes one very minor phase (the possible effect of thirst) in a comprehensive study of grazing and pine reproduction and charges prejudiced research.
>
> Contrary to Chapman's charge, the purpose of Cooperrider's study was to determine just what would happen to ponderosa pine reproduction on a cattle allotment and a sheep allotment, especially, through the application of practical improved range management. That phase of the project was laid out in a comprehensive manner to effectively measure what happened to the reproduction over the allotments and just how it grew under those conditions.
>
> The study gave an indication that the seedlings, even though damaged somewhat by grazing would provide a satisfactory regeneration of the ponderosa pine type if sufficient seed trees were left after cutting and reasonable range management applied. In this management an adequate water supply for livestock was important as well as an adequate quantity of forage.
>
> Through adjustments in grazing on the ranges of the Coconino plateau, which has overcome most of the overgrazing and brought about better seasonal use of the range, the ponderosa pine reproduction has literally grown through the sheep and cattle. This was exactly what Cooperrider's studies showed would happen.

Further substantiation is found in Pearson's "Recovery of Western Yellow Pine Seedlings from Damage by Grazing Animals," published in the October 1931, issue of the JOURNAL OF FORESTRY.

Because of the importance and significance of these results, it seems to us appropriate that a satisfactory reference to them was included in the monograph. Professor Chapman recognizes this. Pearson's own statements were not altered.

Rather than for Professor Chapman to raise this minor point, which might open up a controversy and lead to criticism of Pearson, it

seems to us he should have expressed appreciation for the effort expended in completing for Pearson what can and should be recognized as a monumental report on his lifetime of research.

L. I. BARRETT, *Chief,*
Division of Forest Management Research, U. S. Forest Service.

Logging Leftovers as a Soil Problem

The article by J. W. Allen, "How close can logging leftovers be utilized?" in the February 1951 JOURNAL makes use of some loose generalizations to reach questionable conclusions.

Mr. Allen's premises are, first, that leaves and branches contain the majority of nutrients in the tree and, second, that if a large quantity of wood is left in the forest it will take nitrogen from the soil, increase fire hazard, and discourage seedling growth. Therefore it appears advantageous to him to remove the logs and leave "leaves, branches, brushwood, and limb-sized tops on the ground."

Probably no one would question that continual removal of the leaf litter, twigs, etc., from the forest can lead to drastic site deterioration; that has been almost axiomatic since Ebermayer's work three-quarters of a century ago. Likewise Mr. Allen's generalities about the effects of wood and finer materials on shading, soil protection, fire hazards, etc., may be allowed to stand although the significance attached to these may be very different in areas outside the Pacific Northwest.

There is, however, little reason to believe that leaving a large quantity of wood in the forest will take nitrogen from the soil to any serious extent or for this reason discourage seedling growth. It is true that large amounts of finely divided carbonaceous materials, such as straw and sawdust, often do bring about a temporary nitrogen tie-up when added to soil. This is a very different matter than adding the same type of material concentrated as solid stems which affect but a fraction of the area, decompose very much more slowly and, moreover, often are well rotted before they come into intimate contact with much soil.

Nor need we be concerned about the loss of mineral nutrients and nitrogen by utilization of the larger limbs and "limb-sized tops." Although the nutrient content of the small branches and twigs is often high, the large diameter pieces more closely resemble the stem in composition Apart from economic considerations, leaving large branches, etc., may be warranted in some areas for site protection but certainly not for their nutritional significance, as the text books will show. In passing, there are many stands in Europe that have been subject to extremely close utilization—but without litter gathering—for long periods without site deterioration.

Mr. Allen states that the portable chipper, if widely used in farm woodlots, could produce the same conditions brought about by litter gatherings in Japan and Europe. This is possible but highly improbable. Even assuming that at each periodic cut all the leaves and branches of the felled trees were chipped with the wood and taken away, this would still remove only a small percentage of the total leaf and twig material produced during the cutting cycle. such removal is quantitatively far less significant than the long continued annual gathering of all cast leaves and twigs practiced in Japan and elsewhere in the Orient. A much more real concern to many of us is the possibility that use of the chippers may lead to clear-cutting desirable young stands.

In short, Mr. Allen's stress on the mechanical effects of logging slash for site protection may be all to the good under particular conditions. Other than this, however, increased utilization of logging waste is still largely the concern of technology and economics, rather than of soil science, and is likely to continue so under foreseeable U. S. practices. There are a number of soil problems associated with logging that deserve serious study and, in the face of these, a proposal to "spend many years of observation in all types of stands" to learn the proper degree of waste utilization, *as a soil or silvical problem,* seems to be undue attention to a trival aspect.

EARL L. STONE, JR.,
Assistant Professor of Forest Soils, New York State College of Agriculture, Ithaca.

A British Attitude

Although in general British and American foresters have much in common, their points of view on certain subjects have significant differences. One of these seems to me to be well brought out in a letter recently received from Wilfred E. Hiley, Esq., forester for the Dartington Hall Trustees, Totnes, South Devon, England, a Corresponding Member of the Society of American Foresters. It was written apropos the article by Samuel T. Dana in the JOURNAL OF FORESTRY for February 1951, p. 86, "The Growth of Forestry in the Past Half Century." Mr. Hiley says:

> A curious difference betwen U.S.A. and Britain is that you have to assume that private forestry is chiefly concerned with the financial outlook, whereas State forestry takes into account all the imponderable benefits that may arise from it. In Britain it tends to be the other way, that private owners are more concerned with the influence of forestry on amenity, farming and the general well-being of their parishes, whereas State forestry is almost entirely concerned with maintaining a national supply of timber. It is true, of course, that many British woodland owners are not at all forestry minded, and, so long as the imponderable benefits of forestry are secured, do not take much account of the productiveness of their woods. The difference, of course, is due to the history of our landed gentry, who, despite all we may say against them, have given us a very congenial country to live in.
>
> You will realize that most of the landed families in Britain originally made their money in industry or commerce. Ever since the 16th century, the ownership of land has been a means of entry into the highest social stratum. And the ownership of land has always been associated with responsibility for local Government and for maintaining the welfare of their districts. This is part of our social history. In America you have, of course, had a very different history of rural development, and the difference in our attitude to the private ownership of forests arises, I think, from this cause.

RALPH S. HOSMER,
Ithaca, New York.

We Present

John Frederick Preston

From the quiet countryside of Dickerson in rural Maryland, John Preston can reflect on many fruitful years as a public and private forester. From this vantage point he can relive many exciting moments of forty years dedicated to the cause of making America a better place for our children. He can watch his trees grow, flowers bloom, and the seasons pass, and get renewed enthusiasm for giving others the benefits of his experiences through his writings.

John Preston will long be known as the architect of the farm forestry program for the Soil Conservation Service, and remembered for his leadership in developing that movement in the Department of Agriculture.

Before those days arrived he had had more than thirty years experience in forestry, plus having been raised as a farm boy. Either the forestry experiences or farm experiences alone would not have equipped him to become the leader in farm forestry that he is. Both forestry and farming were elements and in John the blend was perfect.

In Lafayette County, Missouri, at Higginsville, John was born February 26, 1883. From the high school in Higginsville, he went to the University of Michigan where he took forestry courses and was graduated in 1907 with the A.B. degree. But his training did not end there; it continued in forestry and allied fields, and even included another visit to the university for master's degree in forestry in 1915.

It is always of interest to know what prompted an eminent forester to study forestry. In John Preston's case we know exactly. The following quotation is from his diary:

"The reason for my early interest in forestry is still very clear in my mind. About 1900, the *Youth's Companion* was an influential family magazine and a regular visitor in our home. The *Youth's Companion* published a story with Gifford Pinchot's picture, telling about his appointment to head the Bureau of Forestry of the Department of Agriculture and something about what forestry involved. That decided me to study forestry."

JOHN F. PRESTON

On July 1, 1907 Preston joined the U. S. Forest Service, and a year later was assigned to Great Falls, Mont. Another excerpt from his diary will be of interest as typical of the frontier conditions under which many forest officers worked during that period.

"The problem of administration, in addition to grazing, was the settlement of timber trespass, running lines to separate national forest timber from the alienations caused by an intricate system of mining claims, marking and scaling timber, etc. It was a crude civilization in 1908, decidedly pioneer in character. Knives and guns settled many disputes. Shooting from ambush and knifing in the back were not uncommon. There was a general carelessness with human life. At one mining camp where I stayed over night, all was apparently peaceful at breakfast time, and when I returned to the same camp after a day's work in the woods, the floor of the cook house had been freshly mopped to get rid of the blood stains resulting from a fight with knives between the cook and one of the miners. The cook was dead and the murderer in custody of the authorities. Next morning I went out to Zortman on the stage in company of gold bricks going to market and the murder of the cook going to jail. The gold bricks and the murderer were guarded with apparent equal diligence, but I suspect that in case of choice the gold bricks would have received first attention in any safety measures which might have been necessary. There was no excitement however, and passengers, gold bricks, and murderer arrived safely at the Great Northern Railroad which represented the nearest point of contact with outside civilization."

During his assignment in Montana, the first section of the Society of American Foresters was organized at Missoula on December 11, 1911. It is now known as the Northern Rocky Mountain Section. Years later he wrote, "It has always been a source of pride to me that I can class myself as one of the charter members of the first organized section of the Society." He served as chairman of this section in 1917.

In 1948 he wrote, "The Forest Service . . . took a fledgling forester and trained him for eighteen years in the ways of the woods. That was the school from which most of the older foresters, who later served farmers through the Soil Conservation Service, graduated. Sometimes I think we learned more forestry, more of the broad relationship of the woods to the land, more of the dependence of the success of forestry upon an understanding and an appreciation of the people who use the land, than those foresters who continued

in the splendid work being done by the Forest Service."

After those eighteen years with the Forest Service John resigned to work as forester for Hammermill Paper Company of Erie, Pa. Much of his time was spent deep in the Canadian woods incorporating forestry into the business of getting raw material for paper manufacturing.

Then in 1936 when the newly organized Soil Conservation Service went in search of a forester to head the Forestry Division John was called back into public service. Dr. Hugh Bennett made a good choice, because in John he was working with a man who had the interest in and love for the land and the capacity to learn new techniques of a new job. At that time there were few foresters who would have had the vision and the imagination to do the job that he did.

His impatience with loose and sketchy thinking by foresters on technical forestry matters was in direct contrast to his patience with the farmer who had been doing a bad job of forestry. He knew the farmer knew not—the job was to teach him; not teach him to be a forester, but teach him to be a tree farmer. The job was to show him how to farm his woods in the same way that he should farm his other land, and harvest all his crops annually.

He thought that any forest owner who knew what forestry could mean to him would either do the job himself or pay for professional services when needed. He recognized and readily admitted that in the initial or developmental stages of the forestry part of a farm program a limited amount of professional help would be needed. This help would be needed in most cases to get a good forestry program started by an individual or a group. Also, that the public value of good forest land management was such as to justify the initial technical guidance as a public cost. These concepts were developed in detail in Farmers' Bulletin *Woodlands in the Farm Plan*, published by the Department of Agriculture.

It was this kind of leadership that he gave to the group of Soil Conservation Service technicians and farmers who organized the Washington Forest Products Cooperative Marketing Association in Snohomish County. After ten years that organization has not accepted any public monies, and now it is financially stronger than ever. It was this kind of reasoning that prompted him to endorse and promote the timber-agent idea that was first successfully operated in New Jersey. He has been a strong proponent of the idea that the small woodlands offered an excellent opportunity for consulting foresters or retired foresters to do interesting and worthwhile work at a profit.

John's contributions to the philosophy and techniques of farm forestry have had and still have considerable impact on foresters and forest land owners. His concept of the role that public foresters should have, and likewise the private owners' responsibilities, are set forth in his Three Levels of Assistance.

"Level 1, Planning the farm to get forestry included as part of the farm business. This is the 'why' of farm forestry.

"Level 2, Technical forestry assistance, or 'how' to apply forestry techniques.

"Level 3, Specialized technical forestry help or 'how' to make the most money from the sale of forest products. This gets beyond the proper field of public agencies and reaches the point where farmers should help themselves."

This classification of assistance is additional evidence of his conviction that farm forestry is ninety percent farming and ten percent forestry. Therefore, to get forestry applied by the farmer it must start through a farm plan in which all his resources are considered. Forestry for the farmer then becomes a part of his normal farming operations.

"Integrated farm forestry—forestry integrated with the farm business" has been John's theme song. He has stressed the need for recognizing that limitations of labor and equipment impose severe handicaps on the farmer who is interested in doing a good forestry job. "The approach to integrated farm forestry is not how much timber can be cut, but how can the farm woodland best serve the farmer. Obviously, it can best serve the farmer by helping him with his problem of making a living. The farmer is no different from the great mass of people who must have annual incomes with which to pay their current expenses."

Although he was retired from government service in 1947, John's intense interest and enthusiasm has kept him busy telling people, through his writings, how to do the forestry job and what it means to them and to the nation. His *Farm Wood Crops* is another fine contribution through McGraw-Hill Book Company's American Forestry Series.

Even though he has one book published and another in preparation, he has written many articles for the JOURNAL OF FORESTRY, *American Forests*, *The Land*, and other periodicals. His preaching and teaching has also gone into many magazines and newspapers.

His desire to help get more forestry in the woods has led to taking on special field jobs with the Soil Conservation Serivce and the Forest Service since his retirement.

The Society of American Foresters, in recognition of John Preston's varied contributions, both past and present, elected him a Fellow of the Society in 1948. He served two terms as chairman of the Washington Section, in 1924 and 1937, and was elected vice president of the Society in 1927. He has been a member since 1911.

The ability to chart a course, and without thought of self strive for the objective ahead has won the respect and admiration of those who know him. He was never a bureaucrat. He has a keen sense of humor and recognizes that as an essential to sanity, "Without a sense of humor life would hardly be worth living."

T. B. PLAIR.

Reviews

Bernard Eduard Fernow: A Story of North American Forestry.

By Andrew Denny Rogers, III. 623 pp. Princeton University Press, Princeton, N. J. 1951. $7.50.

Bernard Eduard Fernow is the latest of a series of scholarly biographies by Mr. Rogers. Based on exhaustive research, written with meticulous attention to detail, and thoroughly documented, the volume presents the life and career of Dr. Fernow and an extraordinary complete story of the history of forestry from its inception until his death.

Dr. Fernow was born on January 7, 1851 at Inowrazlaw, Prussia. He came to the United States in 1876, lived in this country until 1907, then took up his residence in Canada. He died on February 6, 1923, at Toronto.

Between the years 1882 and 1923, Dr. Fernow was intimately associated with almost every major development in forestry in the United States and Canada. Chronologically, Mr. Rogers retraces the numerous steps in Dr. Fernow's career; coincident with them he gives comprehensive treatment to the events that make up the history of forestry in these two countries.

The story starts with Dr. Fernow's early years, his education and training in Germany, his participation in the Franco-Prussian War, and his arrival in this country. His first years were spent in Pennsylvania where he managed an iron furnace and the property which provided the wood for charcoal. With characteristic tenacity and thoroughness he learned various phases of mining enginering and the relation of charcoal to the reduction of iron ores. He published papers on this subject, and throughout his entire life maintained an interest and connection with mining technology. In 1879 he was married to Miss Oliva Reynolds, the ceremony being performed by Dr. Henry Ward Beecher. It was his romance with Miss Reynolds that brought Dr. Fernow to this country. In 1883 he became a naturalized citizen.

Many events, long preceding Dr. Fernow's arrival in this country, gradually led to the first steps in forest conservation. The disposal of the public lands, the scandals involved, the slow awakening of public interest, and the appointment of Franklin B. Hough to the Division of Forestry in 1876 are discussed at length. Also treated fully are the parts played by the American Forestry Association and the American Association for the Advancement of Science in the development of forest conservation.

While in Pennsylvania Dr. Fernow used every opportunity to study forest conditions. Fortunate in having sympathetic and influential friends, he gradually created for himself a position where his abilities in forestry were recognized. In 1882 he attended the American Forestry Congress at Cincinnati and starting with this event his activities in forestry began to receive well merited recognition. From this time on he became increasingly better known, writing, speaking, and using his influence in the slowly developing field of forest policy. His part in the early development of New York State's forest policy and his role in preparing the law of 1885 indicated his increasing prominence in forestry affairs.

In 1886 Dr. Fernow succeeded Dr. Eggleston as head of the Division of Forestry. All phases of his activities and constructive leadership during his twelve years in federal work are dealt with, considerable space being given to a description of the outstanding work in timber physics that was carried on by Filibert E. Roth. It was during this period that the two important federal laws of 1891 and 1897 were enacted; much interesting material dealing with these pieces of legislation and Dr. Fernow's connection with them is presented. His systematic plan of forestry in 1887 which was set forth as a model for the future of forestry in the United States is listed in detailed outline form.

Next comes the story of the New York State College of Forestry at Cornell, 1898 to 1903. This is one of the high lights of the book. The negotiations that led to Dr. Fernow coming to Cornell, the organizing of the college, the difficulties encountered in the acquisition and management of the 30,000 acre forest in the Adirondack Mountains, the silvicultural techniques employed, the contract with the Brooklyn Cooperage Company, the inadequate financing, the low quality of the hardwoods, the inadequacy of logging supervision, the effective opposition of camp site owners, the suspension of the college and the litigation that followed—all of these phases of those five difficult years are discussed completely and objectively.

Being a lawyer, Mr. Rogers brings in the legal aspects of the suit with the Brooklyn Cooperage Company, a phase which dragged on through the courts until 1912, and one which usuallly is given little attention by previous writers. In the reviewer's opinion this is the best statement on this controversial episode that has ever appeared. Perhaps with this presentation, the first New York State College of Forestry and Axton may well be allowed to rest.

The Cornell and Axton story covers only five years of a long career in forestry. Following the end of the College of Forestry at Cornell, the author tells how Dr. Fernow though still retaining his legal residence in Ithaca, spent the spring term of the college year 1906-1907 at Pennsylvania State College, initiating there the work in forestry which has continued so successfully ever since. Thence his departure for Toronto where he organized and developed the Faculty of Forestry at the University, and where he remained for the rest of his life. The activities at this school, his constructive and busy career in developing the forestry programs

and surveys in the various provinces of Canada are covered in minute detail. During his years at Toronto, the developments in the diverse fields of forestry, both in Canada and in the United States, the problems encountered, the associations formed, and Dr. Fernow's role in many of them are treated comprehensively. Throughout are extensive discussions dealing with Dr. Fernow's activities as editor-in-chief of the *Forestry Quarterly*.

Dr. Fernow led in organizing the Canadian Society of Forest Engineers. It is noteworthy that in 1916 he held the presidency of both the Canadian Society and the Society of American Foresters. Throughout his busy life, Dr. Fernow spoke at innumerable occasions, published great numbers of articles, and traveled widely throughout Canada, United States, and Mexico. Stressed throughout is his broad knowledge of all phases of forestry, but emphasis is continuously given to his close interest in ecology and silviculture, his understanding that the art of forestry could only be built on a firm foundation of science, his good judgment in recognizing facts as they existed, and his appreciation of the slow progress that had to be inevitable.

Frequently the thread of the narrative is broken by many pages of departure into the developments of state forestry, forestry education, research, publications, and personal histories of prominent contemporaries. As the scenes one after another evolve the principal actors are introduced, with brief biographical sketches, and their roles in the enfolding drama fully set forth. To list these events and the names of the foresters connected with them would require many pages of review. Suffice it to say, every forester and every individual who played a part in this historical period are all given space.

Illustrative of the countless experiences, controversives, and episodes scattered throughout this book are Dr. Fernow's early interest in irrigation problems and his acquaintance with Frederick H. Newell, his arguments with Henry Gannett, his travels to Alaska with the Harriman Expedition, his lectures at Yale which resulted in his *History of Forestry*, and his many contacts with Roth, Pinchot, Graves, Schenck, Zon, and other pioneers in the forestry movement.

Fernow was a realist, not an alarmist. Strong willed, he fought for what he thought was right. Almost until the end of his life he maintained a vigorous interest in forestry in North America. Certainly, no one will take exception to the thesis of this book that he was one of the great pioneers who laid the foundation of forestry in North America. Nor will anyone fail to recognize the merit of the many honors that came to him in his later years.

As one completes the reading of this long book he is amazed at the almost unbelievable activity that filled Dr. Fernow's years. He is likewise impressed by the way in which the author has studied, and digested the voluminous literature essential to the preparation of the work.

Clearly brought out is the profound knowledge that Dr. Fernow possessed, his extraordinary energy in organizing, writing, speaking, corresponding, traveling, and consulting, and his ability not only to deal with the issues of the day, but equally important with the problems of the future.

CEDRIC H. GUISE,
Ithaca, N. Y.

Forests and Men.

By William B. Greeley. 255 pp. Doubleday & Company, Inc., New York. 1951. $3.

Colonel Greeley starts his epic of American forestry appropriately with a stirring account of the disastrous 1910 fires in Idaho and Montana—where, as district forester, he won his spurs that year as a forestry leader.

After explaining the basic American "fire" philosophy and the damage it has done, Greeley states, "The conviction was burned into me that fire prevention is the No. 1 job of American foresters." Note, "is," not "was."

The early day stories of the Forest Service in many of which he participated will rekindle pleasant memories for all oldtimers of the Service.

His account of the attempted "raid" on the national forests sounds familiarly like the later struggle between Wallace and Ickes and in the present strong undercurrent for a Department of Natural Resources as recommended by a minority task force of the Hoover Commission. After the Fall fiasco—Teapot Dome—Col. Greeley notes historically that the second great forest crusade started. Its theme was "Is there enough timber?" The author skillfully sets the stage for the players in the ideological battle still raging over whether the U. S. will grow timber by regimentation or by free enterprise. Here in the first days of Greeley leadership of the Forest Service came the great schism, with Pinchot going all out for federal control of private timber cutting and Greeley hewing to his lifelong philosophy of doing "first things first." In this instance first things first meant suppressing and preventing "smoke in the woods" and the watchwords were "cooperation and education."

Col. Greeley chronicles the early rumblings of economic forestry and sums them up succinctly in a neatly turned sentence. "Commerical forestry has often had its start in the competition between a second-growth wood lot and a boxcar." He clearly sees the fallacy in bemoaning the passing of the wild, unmanaged virgin forest. He understands, what many foresters fail to see or choose to ignore, the simple fact that forest industry is continually changing its technology to utilize species and sizes of trees available.

The author realistically tells of the black days of the depression which began shortly after he took the helm of the West Coast lumber industry. He recounts how Article X got into the NIRA lumber code (he wrote it) and says

that the only legacy of the Blue Eagle was the beginning of the moving, growing giant that is industrial forestry in the U. S. today. In an interesting chapter entitled "City Boys Raking Leaves" Col. Greeley eulogizes the important contribution of the Civilian Conservation Corps and its yet greater educational impact on the American public as to the necessity for wise management of natural resources.

His enthusiastic interest in the utilization of wood shows up in the story of modern wood technology with all its wondrous developments from "making big ones out of little ones" to the conversion of the former lowly western hemlock into shimmering rayon yarn. He outlines with pride the bang-up job American forests did in arming, supplying, and shipping the goods to bring victory in World War II and tells how the economic results gave wood technology (and consequently forestry) a vigorous shot in the arm.

He describes the genesis of tree farms, the modern industrial synonym for forest management, in a colorful yet factual way. What he doesn't tell, however, is that he, more than any other man in the nation, is responsible for the widespread expansion and progressive development of better forestry in the woods by extending "cooperation and education" where needed.

He cites the ten-year unparalleled demand for every commodity American trees produce—the first five years for war, the second five for peace. This demand he credits for ushering in "the golden age of American forestry" which, coincidentally enough, begins on the golden anniversary of the forestry profession. He bets on the South to lead the nation in profitable forest management, but he may get some takers on this wager from many Douglas-fir region foresters, including this reviewer.

In his chapter, "Our Public Forests," he cites (1) the famous grazing trespass case, (2) the 1910 Region 1 fires, (3) the first big nation-wide nursery and planting program, (4) the Clarke-McNary Act, and (5) the McNary-McSweeney Act.

The Forest Service through the long years of administration of public properties entrusted to its care had built up confidence among responsible forest owners and operators. With the revival in the early 1930's of the crusade of the Forest Service to regulate private lands, that confidence was changed to distrust and suspicion.

Col. Greeley has observed the ideological warfare over the regulation issue from both sides of the fence. With his long practical experience in both public administration and industrial forestry, he realizes what can be done at a given time in a given situation. He feels a great personal grief because of a lot of unnecessary name calling which he plainly points out didn't help grow a single tree or grow it faster on either national forest or private land.

His whole philosophy on regulation is summed up in two of his own gem-packed paragraphs:

"The job of getting full timber crops on our little woodlands is tough enough, and there are many larger holdings whose management also leaves much room for betterment. Yet it remains my conviction that more trees will be grown by working with the forces and incentives indigenous to the United States than by copying the police controls of other countries.

"We have a native genius for educating people to know on which side their own bread is buttered. It is part of our democracy. Furthermore, while we have been at it for many years, our wood-lot schooling has not yet had a fair chance. It has had mostly an uphill fight against a national oversupply of forest products. Only since Pearl Harbor has the law of supply and demand been pulling with the forester. The forest-earned dollar has become the most persuasive teacher in our school of the woods."

It's difficult to review adequately a book as great and moving as Col. Greeley's. Throughout he exhibits his sense of humor with down-to-earth stories illustrating important moral, economic, and political philosophies. This book is a genuine contribution to the literature of forestry.

There are some books which should be read by every forester. *Forests and Men* is one of them. Intimate acquaintances of Col. Greeley have continuously been inspired by his devotion to the public interest, his practical first-things-first philosophy, his forthrightness and genuinely Lincolnesque character. A forester needs only to read this book to share all these good things which Col. Greeley has brought to the American scene.

W. D. HAGENSTEIN.

The Cacti of Arizona.

By Lyman Benson. 134 pp. Illus. University of Arizona Press, Tucson. (Published at the University of New Mexico Press, Albuquerque) 1950. $4.

Cactus literature has been of two extremes. First has been the pointedly humorous school, characterized by professional cartoonist Reg Manning's unique volume, *What Kinda Cactus Izzat?* This is supplemented by local lore in profusion, including one classification into twenty-seven recognized varieties, beginning with Big Stickers, Little Stickers, Big and Little Stickers, on through the Stick In and Pull Out Stickers, and Stick In and Stay Stuck Stickers.

On the other hand, there has been the more profound school with little unanimity of opinion on species and subspecies, and relying mainly on taxonomy for final identifications. Publications along these lines are likely to be highly confusing to most readers.

Benson's book brings some order out of this chaos, at least for local usage in Arizona. Fortunately, the title and the material are strictly limited in geographical and textual scope. It is written without pretense that it is other than a scientific volume, yet the reader who is a rank amateur will find little in it that he cannot understand. Most common names of general use

in the locality are included. It would have been of interest to have information as to Indian uses of many of these species.

The color plates used are outstanding in quality of reproduction and are well related to the text. Line drawings by Lucretia Breazeale Hamilton and halftone illustrations are plentiful and of great assistance to the reader. Similarly, the geographical distribution maps for the varieties and species are of real value.

The last chapter, giving seven pages on "Care and Culture of Arizona Native Cacti" will be welcomed particularly by home gardeners. Certainly, many of the culture hints given are in direct opposition to the rules for other plants, and well worth study.

The book will be welcomed by students and professional men in this field.

L. A. GARRISON,
National Park Service.

A Manual of the Flowering Plants of California.

By Willis Linn Jepson. 1238 pp. Illus. University of California Press, Berkeley, 1951. $5.

Pacific Coast foresters who are interested in the general flora as well as in the trees will be pleased to learn that this manual is again available after having been out of print a short time. Since the flora of northen California is similar in many respects to that of Oregon and Washington, the book has a wider sphere of use than the title would indicate.

To keep the price the same ($5) the present printing was done by the offset process from the original plates without loss of clearness of print. The binding is sturdy for such a thick book and the clarity of printing excellent.

Jepson's manual is the bible of the California plant student and collector. The description of each plant is quite complete and many of the species are illustrated, 1023 of them, with clear and accurate line cuts.

In addition to the introductory 12-page "General Key to the Families," there is the usual more detailed key for each family in the body of the text and a key for each genus.

The book leads off with an 18-page chapter "Outline of Geographic Distribution of Seed Plants in California" in which the author gives his description of the several life zones and also his concept of genera and species.

EMANUEL FRITZ,
University of California.

An Illustrated Manual of California Shrubs.

By Howard E. McMinn. 663 pp. Illus. 2nd printing. University of California Press, Berkeley, Calif. 1951. $6.50.

The first printing of this manual appeared in 1939 and was published by J. W. Stacey Company. The second printing is now available, published by the University of California Press. So far as the reviewer could tell there has been but one major change; that is the omission of the chapter by F. H. Schumacher on "The use of the California shrubs in the garden design." The author, Howard E. McMinn, is professor of botany at Mills College, California. He has done a thorough, painstaking job. Previously, he published, with Evelyn Maino, *An Illustrated Manual of Pacific Coast Trees*, also recommended.

The manual consists of a systematic, descriptive account of the shrubs of California. All woody perennials and semi-woody plants, except trees and the succulent stemmed shrubs of the Cactus family, are included. In all, about 800 species and 200 varieties of native shrubs, woody vines, subshrubs, wood cushion plants, and half shrubs have been recognized.

The introduction covers the various shrub areas of California under four headings, Desert Shrub Formation, Sagebrush Formation, Chaparral Formation, and Lesser Shrub Areas. In addition, explanation of botanical nomenclature and plant parts are given, along with clear illustrations.

Keys to the families and the genera are given in the front of the manual with the key to the various species embodied in the text under each particular genus. One need not be a botanist to follow these keys but need only to refer to the introduction.

The range of each species is covered in detail.

Where there is a tendency to confuse two species short explanatory notes are included, i.e., ". . . . the glaucous lower leaf-surfaces and general habitat of growth cause it to be confused with the large-leaf forms of Salix lasiolepis."

In the back is found a complete glossary of terms and quite an extensive bibliography.

Throughout, line drawings of most of the species are included. This will be particularly appreciated by those using the book only occasionally.

This manual should find its way on to the book shelves of many of the range managers, foresters, landscape designers, and gardeners of California.

EDWARD C. STONE,
University of California.

Values and Integrals of the Orthogonal Polynomials Up to n = 26.

By Daniel B. DeLury. 33 pp. University of Toronto Press, Toronto, Ont., Canada. 1950. $1.25.

This publication is a valuable addition to orthogonal polynomial technique. The contributions are threefold:

1. Existing tables of orthogonal polynomial values are extended so that orthogonal polynomial beyond the fifth power can be computed.

2. Procedure is presented for fitting orthogonal polynomials to a surface.

3. Procedure and tabular values are present to permit the integration of the orthogonal polynomial.

The book is written for people with some training in statistics and familiarity with matrix algebra.

However, the forester familiar with Fisher and Yates method of fitting orthogonal polynomials, and familiar with a few simple rules for the multiplication of matrixes, will have no difficulty in following the examples.

To the forester the procedure should be of great interest, since the purpose of the publication is to give a method for estimating the error of a systematic survey. In the preface the author states:

> The principal purpose in compiling these tables is to supply the arithmetical basis for a numerical integration procedure, appropriate to situations in which the observed or measured ordinates are subject to a random error. The problem of forming, from a systematic sample, an estimate of quantity and of the error of this estimate may profitably be approached from this direction.

The only criticism I can make of the publication is that technique is applicable only for grids up to 26 x 26 plots. For such size grids the arithmetical work is rather large. However, I think the procedure can and will be readily adapted for use on large surveys.

In spite of the briefness on the arithmetical procedure, the publication warrants careful study by foresters.

ROY A. CHAPMAN,
U. S. Forest Service.

❦ ❦ ❦

Uncle Sam's Acres.

By Marion Clawson. 414 pp. Illus. Dodd, Mead & Company, New York. 1951. $5.

Marion Clawson is the director of the Bureau of Land Management of the Department of the Interior and is thus well qualified to write a story on federal public lands. With this book he presents such a story in an interesting and comprehensive fashion and in language everyone can understand and appreciate. He stresses the important and significant facts concerning the history, description, uses, and administration of these lands, and relates them to the economy and social welfare of the people of the United States.

The author states that this "book seeks to present a comprehensive, balanced picture of all federally owned lands and of the major federal water developments in the United States, in relatively simple terms and primarily for the non-specialist reader." This objective has been attained because it is not highly technical yet it does not lack substance. Its greatest usefulness will be for those who wish to obtain an overall picture and who are not interested in details. They can read it for enjoyment and without compulsion and thus better fit themselves for their responsibilities as conservationists. Public land administrators will find this book of value because of its comprehensive scope. It further can serve as reference material for high school and college students in a wide variety of fields.

The textual material is divided into ten chapters. Those dealing with acquisition, disposal, the reservation systems and their administration are covered in a broad way; for details one must refer to other sources. In recognition of this the author has included a list of references judiciously selected for general availability and to provide the detail. The uses of federal lands are discussed but the development of water resources receives by far the greatest attention not only in the chapter on use but throughout the book where examples are given. In this discussion the enginering phases are stressed at the expense, in the reviewer's opinion, of the land management phases. Greater emphasis could have been given to land use and management in relation to water and thus emphasize the concept of conservation which the average reader can appreciate. Extensive discussion on this matter was probably avoided because techniques of watershed management are still in the developmental stages.

An outstanding feature of the book is a discussion of the budget and appropriation processes of the federal government and the principal types of agency organizations. Along with this is the final chapter dealing with policies and politics and including such important matters as how much public land we should have, and why; also, federal versus states issues, public expenditures, the legislative process, pressure groups, and the role of advisory boards. In these matters the author treats the subject with objectivity and does not aim at selling a program, yet the reader is left with an idea of the author's viewpoints.

The book is materially enhanced (1) by the careful editing supplied by many conservation leaders and authoritities; (2) the inclusion of 27 black and white pictures which tell the story in themselves; (3) the 20 maps and charts and 12 summary tabulations which are so designed as to catch the reader's eye and put across the desired point; (4) a valuable index and table of contents which make for ease in locating specific material.

All these features make *Uncle Sam's Acres* a valuable addition to anyone's library.

ERNEST WOHLETZ,
University of Idaho.

❦ ❦ ❦

Water—Or Your Life.

By Arthur H. Carhart. 312 pp. J. B. Lippincott Co., Philadelphia and New York. 1951. $3.50.

America's growing water problems, dramatized by New York City's water famine in the autumn and winter of 1949-50, has encouraged eastern publishers to venture on a number of popular books on the subject. *Water—Or Your Life* by Arthur H. Carhart, a well-known western writer on conservation, is an exposition of the difficulties the nation faces in getting enough water to the right places at the right time to keep our industrial and agricultural plant operating at full blast and also provide adequate water for domestic consumption and other uses.

This book presents an overwhelming array of case histories, related in vivid journalistic language, that should give citizens cause for sober reflection. Carhart ranges over every part of the country to cite instances of mismanagement of the water resource—the reckless pollution of streams, fool-

ish damming of rivers, callous overpumping of ground waters, building of impractical irrigation projects, destruction of scenic areas by obtrusive dams, and frantic attempts of areas hungry for water to raid localities that have a superfluity of this precious commodity.

Carhart covers the gamut of water problems, emphasizing the potpourri of remedies that are being applied to them and singling out in the now accepted fashion the two main trends: (1) the rivalry of the power-swollen Reclamation Bureau of the Department of Interior and Army Corps of Engineers, and (2) the cart-before-the-horse approach of fixing up our ailing waterways while generally neglecting the upstream watersheds that cause the real damage. He brings together plenty of facts to show the weaknesses of such grandiose schemes as the Central Arizona Project, where the Reclamation Bureau proposes to spend $1.5 billion to keep perhaps 150,000 acres in cultivation, or $10,000 per acre. Since most of this acreage is held by big operators, "the 'rescue' would not be so much a project to protect a bunch of small fellows, who have staked their all on a small plot of land that is their family's salvation. It is rather a big, fat handout to those boomers who gambled and mined water and when they had squandered their wealth, turned to Uncle Sugar to perpetuate them in their exploitation."

Almost as devastating is Carhart's analysis of the Colorado-Big Thompson Project (a $200 million undertaking) which is nearly an accomplished fact. He also does ample justice to other misconceived schemes such as the Pick-Sloan Plan now in the works in the Missouri Valley.

While the author's general approach is sound and his facts generally accurate enough (though in the manner of journalists he fails to give any sources or cite authorities), he is on shaky ground in discussing valley authorities. The term "valley authority" almost makes him see red. He sees "in the TVA pattern of unified management . . . the possibility of a vast revision of our method of government. . . . The agency which has total control of land use and water management in an area has dominant control of the economy, social life and almost everything else within the unit." Of course, this is an egregious assumption. TVA is a grassroots agency, and it has no control over private land-use; it merely suggests through the county agents the patterns of land-use that farmers should follow to improve the soil and build up the local economy. It has no authority to dictate water management on private lands, a field which, in fact, it has scarcely touched so far. All TVA can do is control the flow of water in TVA dams and reservoirs, and does so to prevent floods, facilitate navigation on the Tennessee River, and generate hydroelectric power.

On the subject of the projected Columbia Valley Administration, Carhart is equally far-fetched. He asserts that "a valley authority [in the Columbia Basin] would have overriding direction of every existing government agency. The functions of Reclamation and Army Engineers on waters within the basin would be wiped out totally. The Soil Conservation Service, the U. S. Forest Service, the Bureau of Land Management, the Fish and Wildlife Service, the National Park Service, the U. S. Geological Survey, and all others dealing with natural wealth, would become, in actuality, merely chore boys to carry out the determinations of the dominating corporation. State agencies would be in the same boat. Programs such as the Forest Service, Soil Conservation Service, Park Service, and others operating with expert, highly trained personnel, would be largely scuttled."

Under President Truman's proposal, and in the bills introduced in Congress to create a CVA, no such consequences are suggested. The CVA would be a regional coordinating agency—like those, incidentally, recommended by the President's Water Resources Policy Commission — attempting to bring all water-and-land programs into line and relating them to the actual needs of the people of the Columbia Valley. It would provide for grass-roots control, and could hardly evolve into a totalitarian monster. Why Carhart persists in raising such bogeys and distorting the facts in discussing valley authorities is hard to say.

ANTHONY NETBOY.

Yearbook of Forest Products Statistics 1950.

Food and Agriculture Organization of U.N. 183 pp. International Documents Service, Columbia University Press, New York. 1950. $2.50.

A publication such as this one is not easy to describe or review. But it may be safely asserted that it is a document of the highest importance to an understanding of the place of wood in this world's complicated economy.

First issued for 1947, this is the fourth yearbook of forest products statistics put out by FAO. Information has been garnered from more than one hundred countries by the Division of Forestry and Forest Products.

Notwithstanding considerable improvement in the quality and quantity of the data reported, the coverage is still unfortunately incomplete. Moreover, that the reliability of the statistics leaves much to be desired is a point freely admitted in the book's introduction. However, this publication is still the best, if not the only, record of world forest products statistics, and as such it provides the most useful data extant of global wood production and consumption.

The FAO Division of Forestry and Forest Products is to be congratulated on the marked improvement and progress in its statistical reporting.

HENRY CLEPPER

Current Literature

Compiled by MARTHA MEELIG, *Librarian, The New York State College of Forestry*

Range Management Section Compiled by FRANCES FLICK, *Library, U. S. Department of Agriculture*

General

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Twelve Broadleaf Trees for Nebraska. By E. G. Maxwell. 16 pp. Illus. Univ. of Neb., College of Agric., Ext. Serv., Lincoln. Ext. Cir. No. 1727. 1950.

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Form-Class Volume Tables for Estimating Board-Foot Content of Northern Conifers. By G. A. Biekford. 33 pp. Northeastern Forest Expt. Sta., Upper Darby. Sta. Paper No. 38. 1951. Processed.

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Connwood, Incorporated; An Experiment in Cooperative Marketing. 16 pp. Northeastern Wood Utilization Council, Inc., New Haven 6, Conn. Bul. No. 34. 1951. 50 cents.

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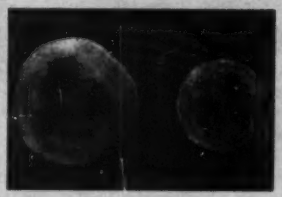
Uses of Commercial Eucalyptus Oils. By A. R. Penfold and F. R. Morrison. 8 pp. Museum of Applied Arts and Sciences, Sydney, Aust. Bul. No. 17, 3d ed. 1950. 6d.

HERE'S PROOF *that* OSMOSE TREATED LUMBER *Lasts Longer*

The board at the left is a piece of Osmose treated Lumber and was subjected to severe exposure tests. Upon examination it was found to be strong and healthy, unaffected by fungi or wood destroying insects.

This piece of ordinary, untreated lumber was subjected to identical exposure tests and the difference in appearance speaks for itself. This board had lost most of its natural strength, crumbled in the hand and was practically consumed by pests that habitually attack unprotected wood.



The light areas in these cross sections from Osmose treated posts graphically portray the deep penetration of the toxic salts. Small dark areas deep in the center of the wood are only spots not fully protected.

Here's what happens when you build with untreated lumber that is subjected to moisture. This porch built directly on the ground would have lasted 3 to 5 times longer if it had been constructed of Osmose treated Lumber.

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Men who know lumber also know that lumber doesn't just wear out . . . it is literally "eaten up" by fungi and hordes of wood destroying insects. However, Osmose treated Lumber stops these pests cold! Osmose treated Lumber is ordinary lumber that has been treated with Osmosalts (a highly toxic chemical mixture) that makes it resistant to decay and termites.

Naturally, the user pays a small premium for Osmose treated Lumber, but when you consider that it lasts 3 to 5 times longer, is fire retardant and NEED NOT BE PAINTED, the use of untreated lumber appears impractical indeed. Osmose treated Lumber, unpainted, is ideal for modern ranch-type houses, cottages, barns, outbuildings, bridges and all types of industrial construction. If you prefer, Osmose treated Lumber can easily be painted and the green treatment color acts as a base coat, thereby saving on paint.

Everything we say about Osmose treated Lumber has been proven over and over again during the past 15 years by our users as well as the Federal Government who have made exhaustive tests. Proof of these service tests is on file and you may have copies by writing to our headquarters. Osmose treated Lumber is sold through Authorized Producers whose operations are supervised and directed by graduate foresters trained specially by the OSMOSE WOOD PRESERVING CO. OF AMERICA, INC., 1437 BAILEY AVE., BUFFALO 12, N. Y.

OSMOSE TREATED LUMBER

Society Affairs

Compiled by ROBERT D. HOSTETTER, *Assistant Executive Secretary*

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EARL PORTER
Southern Kraft Division
International Paper Company
Mobile 9, Ala.

Maki Plans Arrangements For Biloxi Convention

T. E. Maki, vice chairman of the Gulf States Section, has been selected by President Charles F. Evans and C. A. Connaughton, general chairman, to serve as chairman of the committee to make local arrangements for the annual meeting of the Society of American Foresters to be held in Biloxi, Miss. on December 13-16, 1951. Mr. Maki is in charge of the Gulfcoast Research Center, Southern Forest and Range Experiment Station. His address is Box 122, Gulfport, Miss.

It is the task of the local arrangements committee to handle the mechanics of hotel reservations, registration, field trips, information and publicity, ladies' entertainment, meeting facilities, and other features which will contribute to the success of the convention.

Persons who attend the meeting will be requested to pay a registration fee of $2 to cover incidental costs.

Subcommittee assignments on the Local Arrangements Committee are as follows:

T. E. Maki, chairman of Local Arrangements Committee.

Information and Publicity—W. R. Hine, John F. Coyne, George Harvey, J. S. Therrell, C. M. Evenson, Tommy T. Kohara, and J. C. McClellan.

Registration and Welcome—J. E. Bryan, Jr., Edwin R. Ferguson, J. Roland Weston, A. K. Dexter, Ernest R. DeSilvia, James R. Clark, Albert A. Legett, Montgomery A. Payne, and John W. Squires.

T. E. MAKI

Dinner—M. O. Stark, John W. Cooper, and James S. Olden.

Hotel Reservations — David Bruce and Lloyd F. Smith.

Exhibits—James H. Kitchens, John G. Guthrie, and James A. Craig.

Projection and Amplifying Equipment—R. M. Allen and Douglas E. Post.

Ladies Activities—Mrs. J. E. Bryan, Jr., Mrs. A. M. Dantzler, Mrs. A. K. Dexter, Mrs. P. N. Howell, Mrs. T. E. Maki, Mrs. A. W. Nelson, Mrs. M. A. Payne, Mrs. A. L. Shepard, and Mrs. J. W. Squires.

Meeting Rooms — Randle J. Dedeaux, Lewis R. Grosenbaugh.

Field Trips—T. E. Bercaw, J. Butler Brown, A. M. Dantzler, and John W. Thompson.

Grasslands Congress Scheduled for 1952

The United States government is host for the Sixth International Grasslands Congress which is to be held in 1952, probably in June. The meeting probably will be held at one of the land grant colleges, although the final selection has not yet been made.

Previous International Grasslands Congresses have been held in Germany, Sweden, Switzerland, Great Britain, and the most recent was in the Netherlands in 1949.

Lasting five days, the meeting will consist of three or four general sessions and several technical sessions. Over 500 foreign delegates and from 1,500 to 2,000 U. S. participants are expected. Tours will precede and follow the Congress.

At a May 28 meeting of nongovernmental organizations interested in grasslands, the group suggested that the Secretary of Agriculture appoint a nongovernmental advisory committee to assist in planning the Congress, including program, exhibits, tours, and finances. The Society of American Foresters was represented by Robert D. Hostetter. Other Society members in attendance were Arron Denham, Division of Range Management, and Elbert H. Reid, Division of Range Research, U. S. Forest Service.

Nominations Invited for President and Council

The Society's regular biennial election of officers and Council members will conclude on December 1, 1951. The deadline for the submission of petitions nominating candidates for each of the two contests is October 8, 1951. All nominations must be filed in the Society office by that date. A president, vice president. and nine other Council members are to be elected. Any ten voting members may sign a petition such as the following to nominate a Member or Fellow for consideration:

"We, the ten or more undersigned voting members of the Society of American Foresters, hereby nominate _____ to serve as (a member of the Council) (president) during 1952 and 1953."

As the July JOURNAL went to press the following candidates had been nominated:

For President

Stanley G. Fontanna, School of Natural Resources, University of Michigan, Ann Arbor, Mich. (Central States Section.)

DeWitt Nelson, Division of Forestry, Department of Natural Resources, Sacramento 14, Calif. (Northern California Section.)

For the Council

Dwight B. Demeritt, Dead River Company, 6 State Street, Bangor, Me. (New England Section.)

Gordon D. Marckworth, College of Forestry, University of Washington, Seattle, Wash. (Puget Sound Section.)

George R. Phillips, U. S. Departmet of Agriculture, Washington 25, D. C. (Washington Section).

Earl Porter, Southern Kraft Division, International Paper Company, Mobile 9, Ala. (Gulf States Section.)

Perry A. Thompson, 12 Elkin Court, San Rafael, Calif., (Northern California Section.)

Robert K. Winters, Central States Forest Experiment Station, Old Federal Building, Columbus 15, Ohio. (Central States Section.)

Rules governing the nomination of officer and Council member candidates are:

1. All candidates must be Members or Fellows in good standing and state in writing their willingness to serve if elected.

2. Each petition must be for one candidate only and must be signed by at least ten voting members (Junior, Member, Fellow) who are in good standing. A voting member may sign only one petition to nominate a presidential candidate and one petition to nominate a Council member.

3. Petitions must be filed in the office of the Society of American Foresters, Mills Building, Washington 6, D. C. by October 8, 1951.

Council Candidates

DWIGHT B. DEMERITT

Dwight B. Demeritt, manager of woodlands for the Dead River Company, 6 State Street, Bangor, Maine, has been nominated for re-election as a member of the Council. He is currently serving on the Council Committee on Membership.

GEORGE R. PHILLIPS

George R. Phillips, Office of the Secretary, U. S. Department of Agriculture, Washington 25, D. C., has been nominated for election as a Council member. He served as general chairman of the Society's successful Golden Anniversary Meeting.

PERRY A. THOMPSON

Perry A. Thompson, who recently retired from his position as regional forester for the California region of the U. S. Forest Service, resides in San Raphael, Calif. A candidate for election to the Council, he served as chairman of the Northern California Section during the past year.

Appalachian Section Meets Three Times

A series of three meetings is being conducted by the Appalachian Section during this summer, following the success of the same plan last year.

A joint meeting with the Southern Pulpwood Conservation Association, Area 4, was held on May 22 and 23 in the coastal plains region. Richmond, Va. was the headquarters, and members attending the field trip saw the effect of bull-dozing logged over loblolly-hardwood stands as a means of preparing pine seed beds. J. H. Johnson, Chesapeake Corporation, was chairman of the committee which planned the field trip.

The foresters of western North Carolina are in charge of the second meeting which is to be held on July 13 and 14 at Asheville, N. C. Principal speaker will be Reuben B. Robertson, chairman of the board of The Champion Paper and Fibre Company and recipient of the 1950 "Man of the South" award.

Marvin Hoover is planning the third meeting, to be held in the Piedmont region on August 17 and 18. The Fairforest Hotel, Union, S. C., will be the headquarters for the meeting. A field trip featuring the little-leaf disease, as well as other forest and water problems, will be conducted on August 18.

Nominating Procedure For Fellows Outlined

As defined by the Constitution, "Fellows shall be foresters of outstanding achievement as leaders in responsible directive or distinctive individual work of a fruitful character. They shall be engaged in forestry work at the time of their election."

The procedure for nominating candidates for the highest Society membership grade is simple. Twenty-five or more Members or Fellows sign a petition such as the following:

"We the 25 or more undersigned Members and Fellows of the Society of American Foresters, hereby nominate _____ to be considered for election to the grade of Fellow in 1951."

Fellow Nominees

When the July JOURNAL went to press, the following Members had been nominated for advancement to the grade of Fellow:

Hugh Curran, Box 815, Caracas, Venezuela.

E. L. Demmon, Southeastern Forest Experiment Station, Asheville, N. C.

Emanuel Fritz, 243 Forestry Building, University of California, Berkeley, Calif.

George M. Hunt, 129 Bascom Place, Madison 5, Wis.

Myron E. Krueger, 243 Forestry Building, University of California Berkeley, Calif.

Woodbridge Metcalf, 25 Forestry Building, University of California, Berkeley, Calif.

DeWitt Nelson, Department of Natural Resources, State Building #1, Sacramento, Calif.

Harold S. Newins, School of Forestry, University of Florida, Gainesville, Fla.

Jay H. Price, U. S. Forest Service, 623 N. 2nd Street, Milwaukee 3, Wis.

Rules

Rules governing the nomination of Fellow candidates include the following:

1. All candidates must be Members in good standing.

2. Each petition must be for one candidate only and must be signed by at least 25 Members or Fellows who are in good standing. The number of Fellow petitions a member may sign is not limited.

3. Each petition must be accompanied by a factual, not eulogistic, biographical sketch of at least 200 words giving an account of the candidate's education, professional career, and accomplishments. If available, a photograph of the candidate should be submitted.

4. Petitions must be in the office of the Society of American Foresters, Mills Building, Washington 6, D. C. by October 8, 1951.

Pictured above in its actual size is the Gifford Pinchot Award which was made available to the Society by the Pinchot family. The medal is of steel with a gold overlay on the raised portions. The sculptor was Gifford Proctor, Wilton, Conn.

President Charles F. Evans announced at the Society's Golden Anniversary Meeting, December 15, 1950 that the Council had selected Henry Solon Graves as the first recipient of the award. Mr. Graves was a lifelong friend of Gifford Pinchot and was a charter member, past president, and Fellow of the Society. Stated on the reverse of the medal is "Presented by the Society of American Foresters to Henry Solon Graves for outstanding service to the profession of forestry. 1950."

The next presentation of the award probably will be in 1952.

List of Fellows

The current roster of Fellows follows. The state in which each Fellow is domiciled and the year of his election are shown after his name.

Allen, S. W. Michigan. 1948.
Baker, F. S., California. 1949.
Brundage, F. H. Oregon. 1949.
Besley, F. W. Maryland. 1940.
Butler, Ovid. Maryland. 1940.
Carter, E. E. District of Columbia. 1942.
Chapman, H. H. Connecticut. 1922.
Clapp, E. H. Maryland. 1930.
Clepper, Henry. Virginia. 1949.
Coffman, J. D. District of Columbia. 1946.
Dana, S. T. Michigan. 1935.
Eldredge, I. F. Louisiana. 1942.
Evans, C. F. Georgia. 1949.
Ferguson, J. A. Pennsylvania. 1949.
Fischer, A. F. California. 1940.
Frothingham, E. H. California. 1942.
Gill, Tom. District of Columbia. 1948.
Girard, J. W. Oregon. 1944.
Granger, C. M. District of Columbia. 1946.
Greeley, W. B. Washington. 1918.
Guthrie, J. D. Virginia. 1942.
Hall, W. L. Arkansas. 1940.
Hartley, Carl. Maryland. 1949.
Hawes, A. F. Connecticut. 1939.
Hawley, R. C. Connecticut. 1942.
Holmes, J. S. North Carolina. 1939.
Hosmer, R. S. New York. 1932.
Illick, J. S. New York. 1946.
Jeffers, D. S. Idaho. 1948.
Kelley, Evan. Montana. 1949.
Kellogg, R. S. Florida. 1949.
Kinney, J. P. District of Columbia. 1942.
Koch, Elers. Montana. 1940.
Korstian, C. F. North Carolina. 1942.
Lowdermilk, W. C. California. 1948.
MacDonald, G. B. Iowa. 1944.
Marsh, R. E. District of Columbia. 1948.
Martin, C. S. Washington. 1948.
Mason, D. T. Oregon. 1948.
Mulford, Walter. California. 1939.
Munger, T. T. Oregon. 1946.
Munns, E. N. District of Columbia. 1949.
Peavy, G. W. Oregon. 1939.
Preston, J. F. Maryland. 1948.
Schmitz, Henry. Minnesota. 1940.
Show, S. B. California. 1948.
Siecke, E. O. Texas. 1946.
Sparhawk, W. N. New Hampshire. 1946.
Spring, S. N. New York. 1939.
Watts, L. F. District of Columbia. 1946.
Wilson, Ellwood. Quebec. 1949.
Winslow, C. P. District of Columbia. 1942.
Wirt, G. H. Pennsylvania. 1948.
Ziegler, E. A. Florida. 1949.
Zon, Raphael. Minnesota. 1918.

Roberts Heads California Photography Committee

E. V. Roberts heads a committee on aerial photography which was appointed during May by Perry A. Thompson, chairman of the Northern California Section. Other members of the committee are Herbert A. Jensen, Kenneth E. Bradshaw, Earl Sechrist, Ralph Nelson, and Jack Bongberg.

As outlined by Section Chairman Thompson, the objectives and functions of the committee are:

1. To serve as a clearing house for information relative to existing and proposed aerial photographic coverage of the wild land areas of northern California.

2. To study the needs for photo coverage of the wild land areas.

3. To study available information relative to film-filter-scale combinations, and to make recommendations for specifications to govern proposed flying projects.

4. To coordinate the activities toward the procurement of new aerial photography by the several agencies, organizations, and individuals who might be interested in using such photography in any given counties or other unit areas, so that cooperative planning and financing of such projects will lead to more usable and more economical photography.

5. To plan a rotational flying program which will eventually bring all wild land photography up to acceptable standards of usability and newness, and which will enable agencies and others financing the work to plan their budgets far enough in advance so that they may contribute their just share of funds at the proper time.

6. To recommend some equitable means of selling prints from any given project, so that the contributing agencies may obtain them at cost, and non-contributing agencies or individuals will pay a premium price fixed on a sliding scale with time, the profits from the sales of which will be returned pro-rata to the contributing agencies.

7. To encourage further and more intensive use of aerial photos, so that their fullest benefits may be realized and additional support given to the procurement of new photography as needed.

8. To prepare reports for publications in suitable journals or for distribution to Society members, concerning the committee's activities, findings, and recommendations.

Volunteers Plant 5,000 Trees

Some of the volunteers who helped plant 5,000 red pine seedlings on Kettle Moraine State Forest in Wisconsin are pictured above. Clyde T. Smith, supervisor of the forest and a former chairman of the Wisconsin-Upper Michigan Section wields the shovel in this project which was arranged by the Milwaukee Chapter. Roger C. Crabtree, former secretary of the Milwaukee County Conservation Alliance, supervises the work of the enthusiastic crew.

Three other study committees which will report at the Section's winter meeting in December are: Management of Second-Growth Ponderosa Pine in the Sierra Nevada Foothills; John M. Buck, chairman, Warren A. Carleton, William P. Maguire, William C. Finster, Myron S. Wall, Jr., John A. Zivnuska, and George A. Craig; Fire Exclusion Policy in Mixed-Conifer Forest, Ralph Hodges, chairman, John Callaghan, Waller H. Reed, Elmer M. Bacon, Lem C. Hastings, and Inners E. Herrala; and Forest Soils, A. E. Wieslander, chairman, Joseph Kittredge, Clarence R. Quick, James L. Averell, Benton Howard, Earl M. Blair, Leonard Wohletz, R. Earl Storie, and Robert A. Gardner.

The Northern California Section held its annual spring field meeting on June 8 and 9 at Ukiah, Calif. The Masonite Corporation was the host for the meeting. Tours of the company's new hardboard plant and its forests were principal features of the meeting.

Richard E. Roseberry, Henry J. Vaux, and Thomas H. Harris, the Section's recently elected officers, assumed their duties on July 1.

Milwaukee Chapter Sponsors Tree Bee

About 150 persons representing 50 organizations in the Milwaukee County Conservation Alliance participated in the second annual tree planting bee in the southern Kettle Moraine State Forest in Wisconsin, Saturday afternoon, May 12.

The Milwaukee Chapter of the Wisconsin-Upper Michigan Section of the Society of American Foresters was in charge of this year's planting program of the Alliance. Ray E. Bassett of the United States Forest Service was chairman of the committee in charge. Ralph H. Ahlskog and Howard C. Cook of the U. S. Forest Service are the officers of the Milwaukee Chapter.

Nearly 5,000 red pine seedlings were planted during the two-hour period by the men, women, and youths who attended. Afterwards a dedication ceremony was conducted on the site. Larry C. Whiffen, who heads the Alliance, presided, and Arthur Molstad, Wisconsin Conservation Commissioner, gave a brief address.

The afternoon ended with a picnic supper.

Gulf States Section Tours Forestry Projects

Highlight of the May 3-5 meeting of the Gulf States Section were tours of wood-using industries and forestry projects in and near Monroe, La. Over 350 Society members from Mississippi, Louisiana, and Texas attended the Sections annual meeting.

President Charles F. Evans was the chief speaker at the opening session. The second day's technical session, at which George B. Cunningham presided, featured the following talks: "A Report on Crossett's Projects," by Sulo Sihvonen; "Forestry and Grazing," by John Cassady; and "Recent Outbreaks of Injurious Forest Insects in the South," by R. Joseph Kowal and Robert C. Morris.

Toastmaster for the banquet was Charles A. Connaughton who introduced State Senator Charles E. Tooke, Jr., the principal speaker.

Section Officers Help Plan 1951 Society Meeting

The Gulf States Section officers pictured above are among the more than fifty individuals who are at work making plans and arrangements for the annual meeting of the Society which is to be held in Biloxi, Miss. on December 12-15, 1951.

From left to right: James H. Kitchens, past chairman; T. E. Maki, vice chairman; James E. Bryan, chairman; and John Guthrie, secretary-treasurer. The new officers assumed their duties at the meeting of the Gulf States Section on May 5.

Societies Propose Conservation Council

At a joint meeting in Denver, Colo. on April 10 of the local units of the the Society of American Foresters, American Society of Range Management, and the Wildlife Society, all three groups passed resoultions instructing their secretaries to send letters to the Governor of Colorado proposing a "State Conservation Council."

Duties of such a council would be to inform teachers of conservation activities, developing their desires to teach basic principles; set up standardized conservation workshops; provide field trips for the observation of conservation problems; and in general serve as a steering committee for a conservation education program.

The action was taken following a talk by Dr. Tim K. Kelley of the University of Colorado.

At the March 30 meeting of the Central Rocky Mountain Section, the speaker was Preston Walker, general manager of the Grand Junction, Colo. *Daily Sentinel* and president of the Columbine Corporation. The Columbine Corporation has a contract for several million cords of insect-killed and green Engelmann spruce timber on the western slope of Colorado. Construction of a pulp mill is scheduled for completion late in 1952. It will have a capacity of 225 tons of bleached sulphate pulp a day.

The final meeting of the Section for the 1950-1951 season was held at Estes Park, Colo. on May 26, 1951. Arthur H. Carhart gave the feature talk on the subject, "The Changing Wilderness."

Assuming their duties at the meeting were the following newly elected officers who will serve until May 1952: Ralph C. Bryant, chairman, School of Forestry & Range Management, Colorado A & M College, Fort Collins, Colo.; Warren M. Tracy, vice chairman, U. S. Forest Service, Denver 2, Colo.; and Donald J. Hodges, secretary-treasurer, U. S. Forest Service, Estes Park, Colo. Warren Tracy will serve as chairman of the membership committee.

Puget Sound Foresters Volunteer Teaching Help

John W. Allen and K. M. Macdonald of the Puget Sound Section recently embarked on a program aimed at promoting conservation teaching in public schools in Bellevue, near Seattle, Wash.

"We're coming to you as citizens of our community," they said to Roy Thordarson, superintendent of Bellevue schools. "We want to know to what extent conservation of natural resources is taught in Bellevue schools and to offer assistance if it is needed."

Mr. Thordarson stated that teaching units in conservation were included in the Bellevue school curriculum. However, he said that in some cases the teachers were handicapped by unfamiliarity with application of the conservation idea.

Ten local foresters were then asked if they would agree to assist Bellevue teachers in instructing students in forestry and other phases of the conservation of natural resources. Without exception, they agreed. They included William Tinney, West Coast Lumbermen's Association; C. Montgomery Johnson, formerly of Keep Washington Green and now public information director of the Washington Education Association; William Larson, Washington Forest Fire Association; James Ridgeway, Washington Division of Forestry; Paul Pieper, U. S. Forest Service; James Corlett, now in business for himself and formerly employed by the Soil Conservation Service; Howard Millan, White River Lumber Company; and James F. Stevens, West Coast Lumbermen's Association; N. R. Grimm, Ehrlich-Harrison Company; and Ralph G. DeMoisy, director of the Washington Institute of Forest Products.

The superintendent can call on these foresters, and, in addition, he was supplied with bibliographies and lists of suitable moving picture films to supplement conservation teaching.

"It is too early for a progress report, but at least a start has been made, and a modus operandi has been developed," reports K. M. Macdonald.

The Washington, D. C. Section has a similar project in operation.

Northern Rocky Mountain Section Elects Officers

The following officers of the Northern Rocky Mountain Section assumed their duties as of May 1, 1951: Jack S. Barrows, chairman, U. S. Forest Service, Federal Building, Missoula, Mont.; Alfred E. Spaulding, vice chairman, U. S. Forest Service, Federal Building, Missoula, Mont.; William C. Hodge, secretary-treasurer, Northern Rocky Mountain Forest and Range Experiment Station, Federal Building, Missoula, Mont.; S. B. Hutchison, membership chairman, Northern Rocky Mountain Forest and Range Experiment Station, Federal Building, Missoula, Mont.

Royce Cox Heads Inland Empire Section

Royce G. Cox, forester for Potlatch Forests, Inc., Lewiston, Idaho, was elected chairman of the Inland Empire Section in May. He succeeds Milton M. Mosher.

The new vice chairman is Rolf B. Jorgenson, U. S. Forest Service, Riggins, Idaho. Vernon H. Burlison, University of Idaho, Moscow was elected secretary-treasurer.

Candidates for Membership

Candidates for membership whose applications were received in the Society office prior to June 1, 1951, are listed below. Names, positions, addresses, and education are given.

Action regarding the eligibility of these candidates will be taken by the Council as of August 1, 1951. Comments, protests, or important information regarding the qualifications for membership of candidates listed are invited from present voting members. All such communications are kept strictly confidential, being used only by the Council in taking final action on applications.

The names of those candidates who are elected will be published in the Society Affairs department of the September 1951 JOURNAL OF FORESTRY. The names of those who signify their acceptance of election will be published in subsequent issues of the JOURNAL.

Allegheny Section

Junior Grade

Penniman, E. C., Chairman, Socony Vacuum Oil Co., Plainfield, N. J.; Univ. of Me., B.S.F., 1950.

Appalachian Section

Junior Grade

Ference, G. M., Forest Asst., Duke Univ., Durham, N. C.; Pa. State, B.S.F., 1950; Duke, M.F., 1951.

Marlow, E. G., Forester, Kopper Co., Inc., Kingstree, S. C.; Duke, B.S. (Botany), 1949; M.F., 1950.

Reames, W. H., Forestry Aide, U.S.F.S., McClellanville, S. C.; Univ. of Ga., B.S.F., 1949.

Member Grade

Bishop, H. F., Consulting Forester, 305 Harman Park Rd., Marion, S. C.; N. C. State, B.S.F., 1935. Reinstatement.

Central Rocky Mountain Section

Member Grade

Knutson, K. K., Forester, U.S.F.S., Pasadena, Calif.; Colo. A. & M., B.S.F., 1941. (Junior, 1944).

Stadler, G. S., City Forester, Denver, Colo.; Colo. A. & M., B.S.F., 1932. (Junior, 1934R51).

Central States Section

Junior Grade

Idleman, M. K., Forest Rgr., Ohio Dept. of Natural Resources, Logan, Ohio; Utah State, B.S.F., 1950.

Steere, R. B., Box 168, Akron, Ohio; Mich. State, B.S.F., 1951.

Member Grade

Byrd, J. M., Forester, Dept. of Natural Resources, Athens, Ohio; Univ. of Mich., B.S.F., 1938. (Junior, 1940R47).

Affiliate Grade

Easley, A. K., Dist. Warden, Dept. of Cons., Nashville, Ind.

Associate Grade

Compton, L. F. (Miss), Statistician, U.S.F.S., Columbus, Ohio; Randolph-Macon Woman's College, A.B., 1924.

Columbia River Section

Junior Grade

Garey, C. A., 110 West Maple Terrace, Longview, Wash.; Univ. of N. H., B.S.F., 1949; Univ. of Calif., M.F., 1950.

Hall, J. E., Forester, U. S. Indian Service, Klamath Agency, Oreg.; Purdue, B.S.F., 1949.

Links, T. A., Forester, Coos Bay Pulp Corp., Empire, Oreg.; Univ. of Calif., B.S.F., 1951.

Affiliate Grade

Rees, L. N., Logging Supt., Crown Willamette Paper Co., Cathlamet, Wash.

Ross, B. F., Logging Supt., Crown Zellerbach Corp., Seaside, Oreg.

Gulf States Section

Junior Grade

Burkhardt, E. C., Forester, Anderson-Tully Co., Greenville, Miss.; A. P. I., B.S.F., 1950.

Dunford, H. V., Mgr., Forests and Lands, Tremont Lbr. Co., Joyce, La.; Mich. State, B.S.F., 1915.

Lafitte, W. E., Forester, Keith Cranston, Leland, Miss.; La. State Univ., B.S.F., 1950.

Navratil, T. W., Soil Tech., Post Engr., Fort Sam Houston, Texas; Mont. State, B.S.F., 1950.

Thrower, R. L., Area Rgr., Miss. Forestry Comm., Senatobia, Miss.; A. P. I., B.S.F., 1950.

Affiliate Grade

Cooper, W. B., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Dance, J. S., Box 17, Arcadia, La.; L. P. I., B.S.F., 1951.

Darsey, F. E., Field Biologist, La. Wildlife and Fisheries Dept., Baton Rouge, La.; L. P. I., B.S.F., 1950.

Davis, B. H., Forester, Woodard and Walker Lbr. Co., Taylor, La.; L. P. I., B.S.F., 1949.

DeLaney, L., Nurseryman, La. Forestry Comm., Baton Rouge, La.

Dickerson, H. C., Forester, Lone Star Creosoting Co., Longview, Texas; Kilgore College, A.A.; L. P. I., B.S.F., 1949.

Flick, A. W., Jr., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

French, C. S., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Freeman, J. E., Consulting Forester, Natchitoches, La.; L. P. I., B.S.F., 1949.

Futch, Asst. Forester, Brown Paper Mill Co., Monroe, La.; L. P. I., B.S.F., 1950.

Hinkie, J. B., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Hooker, G. B., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Johnson, A. H., Jr., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Johnston, M. C., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Kelly, F. M., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Luzader, J. L., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Lynch, J. S., 1710 Park Ave., Shreveport, La.; L. P. I., B.S.F., 1951.

Miesch, J. R., 3423 Hazel St. Texarkana, Texas; L. P. I., B.S.F., 1951.

Mudd, L. S., 802 Columbia Ave., Shreveport, La.; L. P. I., B.S.F., 1951.

Patton, E. N., Jr., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Ruffin, W. C., Student, L. P. I., Ruston, La.; L. P. I., B.S.F., 1951.

Tyson, R. L., Box 823, Minden, La.; L. P. I., B.S.F., 1951.

Vogt, L. C., 715 Cadiz St., New Orleans, La.; L. P. I., B.S.F., 1951.

Wheeler, H. A., Box 264, Plain Dealing, La.; L. P. I., B.S.F., 1951.

Inland Empire Section

Junior Grade

Hakenson, C. G., Thr. Cruiser, Diamond Match Co., Newport, Wash.; Iowa State, B.S.F., 1950.

Kentucky-Tennessee Section

Junior Grade

Brown, W. L., American Creosoting Co., Inc., Louisville, Ky.; A. P. I., B.S.F., 1949.

Hawkins, W. Z., Forester, Nickey Bros., Inc., Memphis, Tenn.; Univ. of Mo., B.S.F., 1951.

Affiliate Grade

Pert, J. B., Gen. Mgr., Hanna Mfg. Co., Nashville, Tenn.; Univ. of Ga., B.Sc., 1934.

New England Section

Junior Grade

Barlow, K. J., 183 Weld St., Boston, Mass.; Univ. of Mass., B.S.F., 1950.

Affiliate Grade

Kienholz, J. B., Cons. Aide, U.S.D.A., Norwich, Conn.; Univ. of Conn., B.S.F., 1948.

New York Section

Junior Grade

Croom, N. P., Instructor, New Paltz State Teachers College, New Paltz, N. Y.; N. Y. State, B.S.F., 1938; M.Edu., 1946.

Gill, R. C., 375 Buffalo St., Gowanda, N. Y.; Duke, A.B., 1945; M.F., 1950.

Hill, J. A., 102-41 90th Ave., Richmond, N. Y.; N. Y. State, B.S.F., 1950.

Rosasco, E. M., Forest Zoology Dept., N. Y. State College of Forestry, Syracuse, N. Y.; N. Y. State, B.S.F., 1950.

Northern California Section

Junior Grade

May, G. M., Forester, Arcata Lbr. Services, Arcata, Calif.; Univ. of Calif., B.S.F., 1950.

Associate Grade

Van Rensselaer, M., Director, Saratoga Exp. Gardens, Saratoga, Calif.; Univ. of Calif., A.B., 1923. Reinstatement.

Northern Rocky Mountain Section

Junior Grade

Brotz, W. D., Forester, Missoula White Pine Sash Co., Missoula, Mont.; Mont. State, B.S.F., 1950.

Ozark Section

Junior Grade

Hester, J. E., Pole Inspector, Dierks Lbr. and Coal Co., DeQueen, Ark.; Mont. State, B.S.F., 1950.

Knox, S. R., Dist. Forester, Ark. Forestry Comm., Stamps, Ark.; La. State, B.S.F., 1950.

Rawls, I. W., Supt., U.S.F.S., Crossett, Ark. (Affiliate, 1940).

Renard, L. P., Gen. Delivery, DeQueen, Ark.; Iowa State, B.S.F., 1951.

Robine, C. L., Asst. Dist. Forester, Mo. Cons. Comm., Piedmont, Mo.; Univ. of Mo., B.S.F., 1951.

Tschannen, L. E., Farm Forester, Mo. Cons. Comm., Steelville, Mo.; Univ. of Mo., B.S.F., 1950.

Affiliate Grade

May, L. C., Forester, Union Saw Mill Co., Huttig, Ark.; L. P. I., B.S.F., 1950.

Richards, E. G., Millwright, Crossett Lbr. Co., Crossett, Ark.; L. P. I., B.S.F., 1949.

Puget Sound Section

Junior Grade

Dahlgreen, A. K., Forester, U.S.F.S., Entiat, Wash.; Univ. of Wash., B.S.F., 1950.

Schwab, C. A., Forester, Rayonier, Inc., Hoquiam, Wash.; Univ. of Wash.; B.S.F., 1950.

Member Grade

Mayor, F. D., Gen. Partner, Johnson and Mayor Logging Co., Seattle, Wash.; Univ. of Wash., B.S.F., 1936. (Junior, 1937R49).

Rheinberger, R. E., Chief Forester, Pope and Talbot, Inc., Port Gamble, Wash.; Univ. of Minn., B.S.F., 1940. (Junior, 1947).

Affiliate Grade

Meredith, W. K., Chief Engr., Rayonier, Inc., Sappho, Wash.; Univ. of Mo., B.S.C.E., 1923.

Southeastern Section

Junior Grade

Cook, D. R., Jr. Forester, Gulf States Paper Corp., Tuscaloosa, Ala.; A. P. I., B.S.F., 1950.

Girardeau, J. O., 1104 S. Capen Ave., Winter Park, Fla.; Univ. of Florida, B.S.F., 1951.

Goodwin, J. C., Jr., Apprentice Forester, Fla. Forest Service, De Leon Springs, Fla.; Univ. of Fla., B.S.F., 1948; M.F., 1949.

Keier, W. L., Jr., Proj. Forester, Dept. of Cons., Birmingham, Ala.; A. P. I., B.S.F., 1950.

Rainer, Y. W., Proj. Forester, State of Alabama, Montgomery, Ala.; A. P. I., B.S.F., 1949.

Randell, M. T., Box 1668, Ft. Myers, Fla.; Univ. of Fla., B.S.F., 1950.

Starling, W. B., Proj. Forester, State Div. of Forestry, Ozark, Ala.; A. P. I., B.S.F., 1950.

Member Grade

Carruth, H. C., Coosa River Newsprint Co., Coosa Pines, Childersburgs, Ala.; Univ. of Ga., B.S.F., 1936. (Junior, 1936R46).

Dietterich, C. W., 728 W. Peachtree St., N. W., Atlanta, Ga.; Univ. of Calif., 1938. (Junior, 1938).

Goggans, J. F., Asst. Forester, A. P. I., Forestry Dept., Auburn, Ala.; Univ. of Ga., B.S.F., 1942; Duke, M.F., 1947. (Junior, 1947).

Kilgore, W. E., 901 Airport Rd., Jasper, Ala.; La. State, B.S.F., 1934. (Junior, 1934).

Southern California Section

Junior Grade

Pole, R. W., Foreman, U.S.F.S., Pasadena, Calif.; Harvard, B.A., 1940; Univ. of Calif., B.S.F., 1950.

Southwestern Section

Affiliate Grade

Hunt, A. C., Logging Mgr., Southwest Lbr. Mills, Inc., McNary, Ariz.; S. Dakota School of Mines, C.E., 1934.

Washington Section

Junior Grade

Baker, R. D., 4320B Livingston Rd., S.E., Washington, D. C.; Univ. of Calif., B.S.F., 1951.

Associate Grade

Ellis, A. M., (Miss.), Tech. Editor, Div. of Forest Pathology, Beltsville, Md.; S. Dakota State College, B.S., 1934.

Wisconsin Upper Michigan Section

Junior Grade

Katovich, A., Cons. Aid, Wis. Cons. Dept., Wisconsin Rapids, Wis.; Iowa State, B.S.F., 1950.

Seglund, R. O., Laborer, Shingleton, Mich.; Mich. State, B.S.F., 1950.

Taube, A. H., Forest Rgr., Wis. Cons. Dept., Wausaukee, Wis.; Iowa State, B.S.F., 1950.

Foreign

Member Grade

Turner, M. R., Forest Tech., Forest Service, Ministry of Agric., Caracas, Venezuela; Oregon State, B.S.F., 1946; Yale, M.F., 1949. (Junior, 1947).

Candidates Elected

The following persons were elected to the indicated grades of membership by the Council on June 1, 1951.

Junior Grade

Albrecht, F. J.
Anderson, C. W.
Beacom, W. A.
Brickman, T. L.
Burke, H. G.
Burnham, J. W.
Caudill, R. L., Jr.
Chandler, J. H.
Chellman, C. W.
Christianson, E. M.
Christopher, J. F.
Cunningham, P. H.
Detwiler, J. S.
Dickinson, S. K., Jr.
Dumas, K. W., Jr.
Eschner, A. R.
Faulkenberry, V. T.
George, G. W.
Gilmore, A. R.
Hair, D.
Hamilton, L. S.
Hardesty, J. L.
Harris, G. M.
Holman, J.
Holmes, W. E.
Hughes, D. T.
Huston, R. G.
Jaskulski, T. M.
Johnson, A. L.
Johnson, C. D.
Jones, D. E.
Kelley, E. L., Jr.
Kennedy, T. B.
Kilburn, J. R.
Klein, J. A.
Liechti, W. M.
Lyons, T. F.
MacLean, C. D.
Mansberger, B. E.
McAvoy, T. F., Jr.
McDonald, D. E., Jr.
McElwee, R. L.
Metcalf, W. B.
Minetree, J. A.
Mobley, N. F.
Morton, A. D.
Newman, T. J.
Olson, P. L.
Pearce, N. D.
Purcell, W. W.
Reed, A. V.
Reynolds, H. C.
Richardson, F. H.
Rowe, R. W.
Saults, R. W., Jr.
Schaefer, B. E.
Scisner, V. O.
Shilling, R. E., Jr.
Stadler, G. S., (re)
Stoebig, R. W.
Stratton, H. W.
Taylor, J. (re)
Thaanum, R. F.
Vessels, J. L.
Wentworth, I.
Weybrecht, P. W., Jr.
Whitesell, C. D.
Williams, C. R.
Wilson, O. E.
Winter, E. H.

Member Grade

Appler, H. M.
Billingsley, J. C.
Carmean, W. H.
Davisson, R. W.
Dietrick, A. M. (re)
Fillas, T. J.
Frey, R. E.
Gilmo, L. G.
Garegg, H. R.
Hale, J. P., Jr.
Hays, E. F.
Huntley, P. L.
Janes, R. C.
Mart, R. M.
Mattson, C. D.
McKahar, J. H.
McKenna, N. J.
Merkel, E. P.
Mogren, E. W.
Phelps, W. S.
Steensland, M. J.
Swenson, G. W. P.
Wallace, S.
Woodward, H. R.
Yeater, R. F.
Young, C. A., Jr.

Affiliate Grade

Bassler, C. D.
Hanlon, J. A.
Harshman, E. P.
Haskins, N. H.
Lebsch, B. D.
Shaw, C. S.
Siler, W. (re)

Associate Grade

Spears, R. K., Jr.

New Members and Advancements

The new members and members who have been advanced in grade who are listed below are eligible for participation in activities of the Society of American Foresters, including the meetings and projects of Section, Chapters, Divisions, and Committees. They have submitted their applications for membership, properly endorsed, and have been declared eligible by the Council. By accepting election, these members have indicated their desire to assist the Society in the fulfillment of its objectives.

Allegheny Section

Student Grade

PENNSYLVANIA STATE COLLEGE

Coy, R. M.
Dewey, J. E.
Hall, J. L.
Kalwarski, S. A.
Landis, G. H.
Rolston, K. S., Jr.

WEST VIRGINIA UNIVERSITY

Kundt, J. F.
Miller, J. E.
Parsons, J. H.
Sharp, C. B.

Junior Grade

Steigerwalt, M. A., 610 Lafayette Ave., Palmerton, Pa.

Appalachian Section

Student Grade

DUKE UNIVERSITY

Dixon, A. C.
Rhett, R. B.

Junior Grade

Allan, K. M., Duke Univ., Durham, N. C.
Anderson, J. F., Moore, S. C.
Peery, G. W., Va. Forest Service, Salem, Va.

Member Grade

Herelevich, J., Waccaman Bank Bldg., Whiteville, N. C.
Hicks, L. E., 1608 Ramsey St., Fayetteville, N. C.
Marshburn, W. J., Jr., Rockingham, N. C.
Terry, H. L., Box 88, Rocky Mount, N. C.
White, N. M., N. C. Pulp Co., Plymouth, N. C.

Central Rocky Mountain Section

Student Grade

COLORADO A & M COLLEGE

Robertson, J. R.

Central States Section

Student Grade

MICHIGAN STATE COLLEGE

Brown, R. C.
Fritz, D. H.
Lodholz, D. H.
Patton, D. L.
Schoonover, N. B.
Tallia, G. J.
Vander Sys, J. T.
Weidner, R. G.
Zitkovich, S. J.

UNIVERSITY OF MICHIGAN

Post, A. J.

PURDUE UNIVERSITY

Enslen, R. H.
Miller, M. M.
Read, R. M., Jr.

Junior Grade

Foley, T. A., Paris, Ill.
Fyffe, W. E., 1110 East Van Trees St., Washington, Ind.
Green, E. J., Waterloo Recreation Area, Chelsea, Mich.
Gronicki, A. R., 327 Catherine St., Rockford, Ill.
Hamann, R. E., 303½ Noah Pine St., Seymour, Ind.
Harris, C. G., 1014 South 4th St., Lafayette, Ind.
Kiefer, J., Salem, Ind.
Mayrand, E. J., Corunna, Mich.
Richards, B. C., 1106 Sugnet Rd., Midland, Mich.
White, R. E., 1516 Virginia Ave., Rockford, Ill.

Columbia River Section

Student Grade

OREGON STATE COLLEGE

Pierson, E. W.

Junior Grade

Coyer, E. L., Tiller Ranger Sta., Tiller, Oreg.

Member Grade

Barber, M. F., U.S.F.S., Hebo, Oreg.
Davis, J. F., Ochoco Ranger Sta., Prineville, Oreg.
Gansberg, W. O., 412 Ridgeway Ave., Camas, Wash.
Goodmonson, P. N., Oregon State College, Corvallis, Oreg.
Curley, W. E., Cascade Locks, Oreg.
Kirkpatrick, H. W., Gasley Route, Myrtle Creek, Oreg.
Mayer, C. E., 423 U. S. Court House, Portland, Oreg.
Peick, C. F., Box 15, Klamath Agency, Oreg.
Prater, J. D., Route 1, Cathlamet, Wash.
Stewart, L. L., 218 Loretta Way, Eugene, Oreg.
Williams, G. W., 326 S. 9th St., Corvallis, Oreg.
Withee, O. A., Ochoco National Forest, Prineville, Oreg.

Associate Grade

Austin, R. C., Crown Zellerbach Corp., Camas, Wash.

Affiliate Grade

Jackson, G. H., 4515 N. Interstate, Portland, Oreg.

Gulf States Section

Student Grade

LOUISIANA STATE UNIVERSITY

Crowell, S. F., Jr.
Kelley, F. G.
Morris, G. S., Jr.
Reynolds, G. L.
Rhodes, J. W.

Junior Grade

Berkley, R. L., Bude, Miss.
Cameron, D. C., Box 173, Leakesville, Miss.
Evenson, C. M., 130 Richards Ave., Gulfport, Miss.
Knouse, H., Box 384, Colfax, La.
Martin, C. H., Jr., Kirby Lumber Corp., Cleveland, Texas.
Mims, J. K., Box 509, Corinth, Miss.
Moran, H. B., 231 South Washington, Greenville, Miss.
Netterville, J. W., Jr., 708 8th St., Pascagoula, Miss.
Sykes, C. K., U.S.F.S., Jackson, Miss.
Young, E. J., International Paper Co., Natchitoches, La.

Member Grade

Moore, L. H., Box 107-C, Greenville, Miss.
Norris, F. W., 516 Kirk Circle, Greenville, Miss.
Ritchie, J. I., La. Forestry Comm., Woodworth, La.

Affiliate Grade

Dantzler, T. H., 634 Beach Blvd., Pascagoula, Miss.
Hammond, J. G., 489 Prewitt St., Magnolia, Miss.

Inland Empire Section

Student Grade

UNIVERSITY OF IDAHO

Nobis, R. S.

Junior Grade

Dowd, L. W., Chewelah, Wash.

Member Grade

Boy, G. L., Fenn Ranger Sta., Kooskia, Idaho.
Neff, P. E., Newport, Wash.
Peterka, M. J., Box 135, Orofino, Idaho.

Affiliate Grade

Duvendack, G. H., 531 Washington Ave., St. Maries, Idaho.

Intermountain Section

Student Grade

UTAH STATE AGRICULTURAL COLLEGE

Spencer, J. V.
Weissert, R. H.

Member Grade

Packer, P. E., U. S. Forest Exp. Sta., Idaho City, Idaho.
Watts, G. L., Idaho City, Idaho.

Kentucky-Tennessee Section

Junior Grade

Dickhaus, R. V., 1118 Cecelia Ave., Park Hill, Ky.
O'Brien, D. E., 221 Hickory St., Cookeville, Tenn.
Watkins, W. P., R. D. No. 4, Buechel, Ky.

Member Grade

Ellenberg, E. G., U.S.F.S., Unicoi, Tenn
Rider, R. R., 912 Walnut, Benton, Ky.

New England Section

Student Grade

YALE UNIVERSITY

Skeele, J. R.

Junior Grade

Gardner, N. B., 61 North Spring St., Concord, N. H.
Harris, C. E., 51 Elm St., Bangor, Me.
Plumb, A. W., Box 206, Newport, N. H.
Stulpin, E. J., Mt. Blue State Park, Weld, Me.
Wing, M. R., International Paper Co., Ashland, Me.

Member Grade

Logan, B. A., 95 Empire Ave., Montreal, Canada.
McConkey, T. W., Alfred, Me.

Affiliate Grade

Mook, P. V., 360 Prospect St., New Haven, Conn.
Tryon, T. C., 192 S. Main St., Old Town, Me.

New York Section

Student Grade

STATE UNIVERSITY OF NEW YORK

Bailey, H. J. — Schaufler, P. G.
Fulton, P. A. — Trew, I. F.
Lyon, R. E. A.

Member Grade

Klemm, M., E.C.A.-G. c/o Postmaster, New York, N. Y.
Weight, F. F., 40 Jackson Ave., Middletown, N. Y.

Northern California Section

Student Grade

UNIVERSITY OF CALIFORNIA

Cheshire, J. T. — Jope, H. B.

Junior Grade

Burton, J. D., Sierra National Forests, Northfork, Calif.
Cobb, D. L., Box 212, West Point, Calif.
Lofgren, J. O., 1864 Willowside Rd., Santa Rosa, Calif.
Nichols, E. E., U.S.F.S., Susanville, Calif.
Padgett, J. R., U. S. Navy, San Francisco, Calif.
Stokes, R. E., U.S.F.S., Alturas, Calif.

Member Grade

Arnold, H. L., Box 69B, Visalia, Calif.
Bryan, S. H., Box 298, West Point, Calif.
Keast, F. W., Blasingame Ranger Sta., Academy, Calif.
Sechrist, E. E., Jr., 3992 McKinley Blvd., Sacramento, Calif.
Tackle, D., Box 245, Berkeley, Calif.

Affiliate Grade

Columbro, C., 732 Dutton Ave., Santa Rosa, Calif.
Hickle, R. C., 312 Palm Ave., Woodlake, Calif.
Ingram, O. A., 3563 Circle Court E., Fresno, Calif.

Associate Grade

Gray, C. T., Box 1731, Stockton, Calif.

Northern Rocky Mountain Section

Student Grade

MONTANA STATE UNIVERSITY

Lellelid, H. R. — Olson, A. H.
Welch, G. D.

Junior Grade

Jacobson, A., Box 395, Yellowstone Park, Wyo.
Knechtel, W. C., 21 Lake St., Missoula, Mont.
McKinsey, R. A., 839½ Evans, Missoula, Mont.

Member Grade

Grambo, E. J., 821 California Ave., Libby, Mont.
Phillip, M. F., Phillipsburg, Mont.

Ozark Section

Student Grade

UNIVERSITY OF MISSOURI

Sander, I. L.

Junior Grade

Deed, R. N., 1050 Caddo St., Arkadelphia, Ark.
Dressel, A. T., 623 Pine St., Arkadelphia, Ark.
Edscorn, K. C., Box 8057, Kansas City, Mo.
Glaser, E. H., Van Buren, Mo.
Lashley, O. L., 422 N. Shepherd, Ironton, Mo.
Matt, L. E., 1329 Belton Ave., Webster Groves, Mo.
Stevenin, H. L., Box 158, Kirksville, Mo.
Welch, H. D., Jr., 522 West Fifth, Cameron, Mo.
Wood, E. B., Cloud Oak Flooring Co., West Plains, Mo.

Member Grade

Hartrick, G. D., Fountain Hall, Ark.
Markell, M. L., Jr., Dist. Forester's Office, Dierks, Ark.
Seagle, W. D., 406 Henderson St., Hot Springs, Ark.
Wishart, J. E., Rte. I, Wilmar, Ark.

Affiliate Grade

Gotcher, J. T., 928 S. 20th St., Chikasha, Okla.

Puget Sound Section

Student Grade

UNIVERSITY OF WASHINGTON

Grayum, G. H. — Palmer, R. L.
Lee, J. B., Jr. — Thompson, D. W.

Junior Grade

Stevens, G. J., Box 231, White Swan, Wash.
Warner, L. H., Tieton Ranger Sta., Naches, Wash.

Member Grade

Hopkins, D. R., 406 Transportation Bldg., Olympia, Wash.
Mathers, W. G., Forest Insect Lab., Vernon, B. C., Canada.
Maycock, C. P., Box 757, Sitka, Alaska.
Yocom, T. R., West Columbia St., Monroe, Wash.

Southeastern Section

Student Grade

ALABAMA POLYTECHNIC INSTITUTE

Ball, H. E. — Maxon, C. E.
Capell, J. R. — McDaniel, T. J., Jr.
Caylor, D. A., Jr. — Nye, W. K.
Crouch, J. E. — Pipkin, R. L.
Dillon, S. T. — Reese, J. L., Jr.
Douglass, J. E. — Rollins, C. W.
Dunn, H. V., Jr. — Stockman, J. E.
Engel, J. E. — Stuckey, W. N., Jr.
Farrell, J. R. — Swift, C. S.
Gamble, R. J. — Thompson, W. S.
Gant, E. S. — Vick, T. B.
Grissom, H. S. — Walker, L. B.
Haynes, J. D. — Zingelmann, W. H., Jr.
Luke, K. E.

UNIVERSITY OF FLORIDA

Heintz, R. H. — Sorenson, C. S. K.
Moak, J. E. — Stacy, W. R.
Snaidman, W. C. — Willaky, H. F.

Junior Grade

Bailey, H. B., Jr., Box 442, Moultrie, Ga.
Brown, C. W., 17 Polk St., Sylacauga, Ala.
Bullock, W. R., Jr., 402 Orange St., E., Tuscaloosa, Ala.
Carlson, B. D., Coosa River Newsprint Co., Dadeville, Ala.
Petty, L. E., U. S. Naval Sta., Green Cove Springs, Fla.

Southwestern Section

Junior Grade

Hall, W. S., Jr., Box 710, Silver City, N. Mex.
Hughes, D. C., Willow Creek Ranger Sta., Mogollon, N. Mex.
Olson, C. H., Box 127, Cuba, N. Mex.

Member Grade

Wilson, K. O., 935 North Monroe, Albuquerque, N. Mex.

Upper Mississippi Valley Section

Student Grade

IOWA STATE COLLEGE

Nervig, S. O. — Schienbein, A. G.

UNIVERSITY OF MINNESOTA

Nixon, R. J. — Seed, G. K.

Junior Grade

Hamilton, J. W., 417 4th Ave., Littlefork, Minn.

Member Grade

Guilkey, P. C., Lake States Forest Exp. Sta., St. Paul, Minn.

Washington Section

Junior Grade

Carlson, F. J., Jr., U. S. Army, Ft. Belvoir, Va.
Mathews, W. G., Jr., 907 Broad St., Altavista, Va.

Wisconsin-Upper Michigan Section

Junior Grade

Buell, D. L., Patten Logging Co., Amasa, Mich.
Hall, F. C., 6166 N. Kent, Milwaukee, Wis.
Moran, J. J., Nekoosa-Edwards Paper Co., Port Edwards, Wis.
Seybold, W. H., Griffith State Nursery, Wisconsin Rapids, Wis.
Sweningson, R. T., Box 13, Peshtigo, Wis.

Member Grade

Dosen, R. C., Box 19, Port Edwards, Wis.

Affiliate Grade

Allhiser, A. F., 616 Fulton St., Wausau, Wis.

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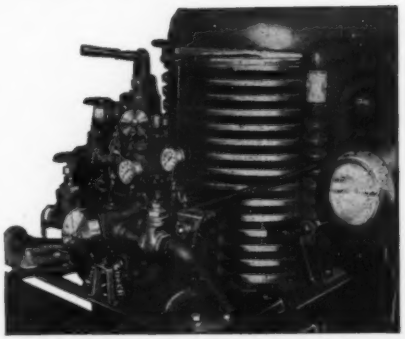
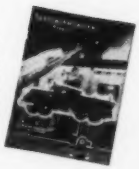
Whether the truck is in creeper low or moving rapidly, the UA-50 delivers effective high pressure fog or straight streams.

The Model UA-50 also has many other additional features that are well worth knowing about. Before you decide on your fire pump, call the Barton-American representative in your area.



AMERICAN-MARSH PUMPS



Ask for Bulletin 8330 which fully describes all the outstanding features of the UA-50 including its frost-proof construction, high pressure performance using Barton Super-Fog guns, and its specifications.

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Forestry News

E. I. Kotok Takes FAO Position

Edward I. Kotok, assistant chief of the U. S. Forest Service in charge of research, retired May 31 after 40 years of service. He has accepted a position with the Food and Agriculture Organization of the United Nations as head of a Chilean mission on forestry, agriculture and fisheries, with headquarters in Santiago, Chile. He has participated in FAO activities since the beginning of the organization.

Mr. Kotok came to Washington in December 1941 to serve as assistant chief of the Forest Service in charge of state and private forestry. In 1944 he was appointed assistant chief in charge of research.

He received a B.S. degree from the City College of New York in 1909 and a master's degree in forestry from the University of Michigan in 1911. He was then appointed as forest assistant on the Shasta National Forest in California and in 1916 was made supervisor of the Eldorado National Forest of California. In 1920 he was placed in charge of national forest fire control and fire cooperation activities for the California region.

He headed the California Forest Experiment Station at Berkeley from its establishment in 1926 until 1941. During this period he was consultant forester at the University of California at Berkeley and was also chairman of the Department of Agriculture sub-committee in charge of developing the Los Angeles river watershed project, first of its kind under the Flood Control Act.

Harper Heads Forest Research

Dr. Verne L. Harper, director of the Northeastern Forest Experiment Station at Upper Darby, Pa., has been appointed assistant chief of the Forest Service in charge of research. He succeeds Edward I. Kotok, who resigned June 1 to take a position with the Food and Agriculture Organization in Chile.

In his new assignment, Dr. Harper will coordinate all research activities of the Forest Service. He will supervise seven divisions in the Washington office, the Forest Products Laboratory at Madison, Wis., 12 regional forest and range experiment stations, 62 forest, water and range research centers, and 102 experimental forests.

Since 1945 Dr. Harper has directed research carried on by the Northeastern Forest Experiment Station in New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, and the six New England states. Prior to his appointment as station director, Dr. Harper served for eight years in the Washington office of the Forest Service.

Dr. Harper joined the Forest Service in 1927 as a junior forester. For 10 years he was attached to the Southern Forest Experiment Station at New Orleans, La., and conducted research assignments throughout the South. One of his studies resulted in lowering production costs of naval stores.

He was born in Monroe, S. D. He received a master of science degree in forestry at the University of California in 1927 and a Ph.D. degree in forestry and economics at Duke University in 1943.

Back-Country National Forest Timber Offered for Sale

One of the few undeveloped and unused national forest timber working circles in the Northern Forest Service Region will be placed in production through a sale offered for bidding August 21. The offer consists of 188,500,000 board feet of sawtimber of which over 100 million board feet is western white pine. About 17 percent of the timber is in the Trout Creek drainage south of Superior, Mont., while the remaining 83 percent is in the inaccessible Kelly Creek working circle in the headwaters of the North Fork of the Clearwater River in Clearwater County, Idaho.

In order to move timber from the area the purchaser must build 40 miles of main haul access road. Several hundred miles of additional secondary and spur roads must also be built in order to log the timber.

The Kelly Creek working circle contains about one billion board feet of mature and overmature sawtimber of which nearly 60 percent is western white pine.

The sale area is in two units. The Cedars unit, Clearwater National Forest, Idaho, contains 18,933 acres and the 4,059-acre Upper Trout Creek unit is in the Montana portion of the Lolo National Forest. The contract period will extend to December 31, 1969. Auction bidding will be conducted in Missoula, Montana, at 2:00 p.m., August 21, 1951. Cutting for the first period of several years will be at the rates bid. Thereafter, stumpage rates will be determined by periodic reappraisal that considers then current logging costs and lumber values.

COL. W. B. GREELEY, dean of industrial foresters, and Vincent Bousquet, program chairman of Puget Sound Section, Society of American Foresters, display commemorative plaque on the Clarke-McNary Act. Greeley was U. S. Chief Forester in 1923 when this foundation law of modern American forestry was developed. The key hearing of the Senate Select Committe on Forestry was at Snoqualmie Falls Inn, near Seattle. The plaque, with its inscription headed "Historical Event," now hangs on the inn's veranda.

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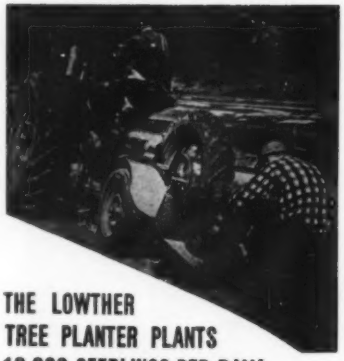

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Bureau of Land Management Names New Regional Chief

Two major Bureau of Land Management appointments were announced May 8.

Assistant Director William Zimmerman, Jr., was named to the position of associate director, succeeding Roscoe E. Bell, who was made director of the bureau's number one region in Portland, Oreg. Daniel L. Goldy, former regional administrator in Portland, resigned to accept a position with the Economic Cooperation Administration.

The new associate director of the Bureau of Land Management, William Zimmerman, Jr., has served continuously with the Department of the Interior since his appointment by President Franklin D. Roosevelt as assistant commissioner of the Bureau of Indian Affairs, May 26, 1933.

Prior to his appointment to the Interior Department, Mr. Zimmerman served from 1911 to 1917 as editor and writer of the *World Book* and *Compton's Pictorial Encyclopedia*. In 1917, he became vice president of the Columbia Conserve Company of Indianapolis and had a large share in preparing and carrying out "the industrial democracy" plan undertaken there, by which ownership of business was vested in the employees.

Born in Payette, Idaho, March 11, 1905, Roscoe Bell learned agriculture as a boy through practical experience on farms in his native state and in the Columbia basin area of Washington. His introduction to forest industry came through several years' work in the lumber mills of western Washington and in the forest disease control in the white pine area of northern Idaho.

After receiving his B.S. and M.S. degrees from the State College of Washington, Pullman, he held positions of professor and research worker in soil science at Washington State College and the University of Idaho for eight years.

Mr. Bell entered government service in 1935 and served as a land classification specialist and agricultural economist with the Farm Security Administration and the Bureau of Agricultural Economics.

In September 1942 he transferred to the War Relocation Authority with the responsibility of planning the organization and generally supervising the extensive agricultural, livestock, engineering, and fire protection operations of the Central Utah Project at Topaz, Utah. Named industrial analyst for the Bonneville Power Administration in 1945, Mr. Bell made special investigations and acted as coordinator for the Department of the Interior's western phosphate program.

Olympic National Forest Boundaries Changed

Secretary of the Interior Oscar L. Chapman signed a public land order on May 23, 1951 which has the effect of redrawing the boundaries of Olympic National Forest in Washington.

This order makes only a minor change in the boundaries of Olympic National Forest. Approximately 8,785 acres of privately owned lands are excluded from the forest—making the gross boundaries conform more closely to existing national forest lands, and facilitating the administration of the forest.

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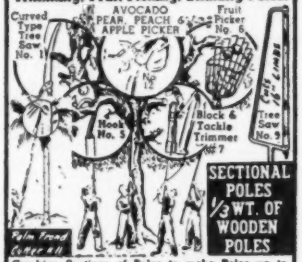
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Hook No. 5
Block & Tackle Trimmer #7
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Chemical Debarking Study

Cooperative research by industry and education into the chemical debarking of living trees got under way May 1 at State University of New York, College of Forestry, Syracuse. Private co-sponsors are nine pulp and paper companies and a chemical company, with the cooperation of other interested pulp and paper firms.

The research team includes: Dr. Hugh Wilcox, plant physiologist of California, for the last five years a wood technologist at the Oregon Forest Products Laboratory, Corvallis; Dr. Felix Czabator, forest botanist and pathologist, who has 11 years of forestry and logging experience; Dr. Robert F. Smith, bio-chemist, who has studied the chemistry of proteins recently at the University of Minnesota; and Douglas C. McIntosh, consulting forester on loan by the Canadian Forest Products Laboratory, Ottawa, where he is a staff wood technologist.

Dr. Wilcox is group leader, with Dr. Czabator in charge of field operations. These began in April with reviews of field equipment and methods of chemical debarking by West Virginia Pulp and Paper Co., International Paper Co., and Armstrong Forest Co.

Development of "simple, efficient, and controllable techniques" for loosening bark of living trees is the aim of the project.

Other considerations are being taken into account, such as management and logging problems, retention of chemical in the wood, and its effect on pulping and quality of the finished paper.

The Huntington Wildlife Experiment Forest, 15,000-acre property of the college in the central Adirondacks, will be the principal site of the work. The project, set up for a year ending April 30, 1952, with the way open for renewal, has an initial budget of $64,000. Of this, $50,000 is a grant from the industry sponsors and $14,000 is a contribution in services, supplies, and equipment from the College of Forestry.

The grant is the first one to the new Research Foundation of State University of New York, specially established to encourage and administer private financing of research by university personnel and facilities.

Dean Joseph S. Illick, Dr. Hardy L. Shirley, and Dr. Edwin C. Jahn are the college committee for the research. The corresponding industry committee consists of M. H. Collet, K. A. Swenning, L. J. Kugelman, R. R. Drummond, H. G. Schanche, and Y. E. Lebede. H. E. Brinckerhoff and W. S. Bromley of the American Pulpwood Association are project treasurer and secretary respectively.

Sponsoring companies of the nonprofit unincorporated association supporting the research are International Paper Co., Penobscot Chemical Fibre Co., St. Croix Paper Co., American Smelting & Refining Co., P. H. Glatfelter Co., Brown Co., Hollingsworth & Whitney Co., Oxford Paper Co., Eastern Corp., and West Virginia Pulp and Paper Co. Cooperating companies are the Armstrong Forest Co. and the Marathon Corporation.

Robert M. Ross Retires

On June 30, Robert M. Ross, for the past 3 years chief of the Nursery Division of the Soil Conservation Service, retired to return to his farm in Tenants Harbor, Maine.

Mr. Ross is a 1911 graduate of the Biltmore Forest School. From 1923 to 1929 he served as state forester of Vermont, and for 6 years was forester for the Connecticut Forest and Parks Association. In 1935 he joined the Soil Conservation Service and served as regional forester and later as assistant regional director for the Southeastern Region and assistant chief of operations in the SCS Washington office.

Foresters Win Award For Fire Prevention Series

The homespun forest fire prevention messages of Jelly Elliott and his "Three Knotheads" won first honors in the agricultural division at the Fifteenth American Exhibition of Educational Radio Programs sponsored by the Institute for Education by Radio-Television at Ohio State University during the first week in May.

The award was made to the U. S. Forest Service and the Association of State Foresters for sponsoring two 13-week series of 15-minute transcribed radio programs by Jelly Elliott and his hillbilly band. The recordings are being presented as a public-service feature by more than 800 radio stations.

The two radio series were arranged by Henry Wehde of the Advertising Council, Inc., and Clint Davis and Bill Bergoffen of the U. S. Forest Service with the assistance of J. H. Kitchens, Jr., chief of the information and education branch of the Louisiana Forestry Commission, now executive director of the Louisiana Forestry Association.

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Dr. Schenck Visits U.S.A., Receives Honors

Under the auspices of the American Forestry Association, Dr. Carl A. Schenck is making an extended tour of the United States. This is Dr. Schenck's first visit to the United States since 1938.

Dr. Schenck, a native of Darmstadt, Germany, first came to the United States in 1895 as forester for George W. Vanderbilt's Biltmore Estate at Asheville, N. C. In 1898 he started the Biltmore Forest School. During the fifteen years' existence of the Biltmore Forest School some 400 students were graduated.

Dr. Schenck recalls that when he first arrived in America the Northern Pacific was building a railroad—the rails being imported from Germany and the locomotive from England. The great pine forests of Minnesota were just in process of being lumbered. Today, Dr. Schenck declares America is leading the world in good forestry practices.

S. L. Frost, executive director, American Forestry Association, greets Dr. C. A. Schenck in Washington, D. C.

On arrival in New York from his present home in Lindenfels, Germany, Dr. Schenck was met by many old friends and alumni of the Biltmore Forest School. A reception was given him in New York by 40 Biltmore Forest School alumni, who came from as far north as Maine and as far south as the Carolinas.

In Washington Dr. Schenck was greeted by S. L. Frost, executive director of the American Forestry Association. Luncheon hosts while there included Ovid Butler, executive director emeritus of the American Forestry Association; Tom Gill, secretary of the Charles Lathrop Pack Forestry Foundation; and others.

On July 4th, eight miles north of the small northwest California coastal town of Orick, in Prairie Creek State Park, forty acres of redwood trees will be dedicated as the Carl Alwin Schenck Grove. A large stone with bronze plaque in a cloistered vale within the grove will appropriately mark the spot in his name.

On July 7th a working circle of the 200,000-acre Millicoma Forest Tree Farm in Oregon will be dedicated as the "C. A. Schenck Working Circle." Arrangements for this event are being made by the Weyerhaeuser Timber Company.

Campers, Smokers Start Fewer Fires

Although recreational use of national forests reached an all-time high last year, campers and smokers caused fewer forest fires in 1950 than they did during 1949.

Smokers were responsible for 1,701 fires on national forests last year as compared with 1,842 fires in 1949.

Campers accounted for 596 fires on national forests in 1950 as compared with 628 fires in 1949.

The record for incendiary fires, however, is just the reverse. During 1950 incendiarists started 1,724 fires on national forests. This was a significant increase over 1949, when "fire bugs" set a total of 1,204 fires on national forests.

The incendiary problem is most acute in the South. During 1950 incendiarists started 1,392 fires on national forests of the 11 states lying south of Virginia.

The North Central Region, which comprises Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, North Dakota, Ohio, and Wisconsin, was second in number of incendiary fires with a total of 252 last year. California was third with 50 incendiary fires.

Wisconsin Wildlife

Prepared primarily for use by the youth of Wisconsin, a new booklet, *Wisconsin Wildlife*, is being distributed by the Wisconsin Conservation Department to pupils and teachers of the state. It is a comprehensive, illustrative check-list of both game and non-game species, and includes discussions of conservation practices.

Louisiana Information Chief

Ralph T. Wall has been named chief of the Information and Education Branch of the Louisiana Forestry Commission. He succeeds J. H. Kitchens, Jr. now executive secretary of the Louisiana Forestry Association.

ROBERT T. WALL

Wall came to the commission three years ago as youth program director and assistant chief of the Information and Education Branch.

A graduate of the Louisiana State University Forestry School in 1941, Wall entered the Infantry upon graduation. He served for five years, 15 months of which was spent in the European theater of operations. He left the service as a captain, and for two years he managed 1,500 acres of citrus tree plantations in Florida. From there to Jefferson Davis Parish, Louisiana to teach on-the-farm training to veterans.

Large Eastern Timber Sale

Sale of 50 million feet of standing timber on the Monongahela National Forest, in West Virginia, was made recently by oral auction to the Mower Lumber Company, of Charleston. The sale provides for a 10-year removal period.

Timber involved was primarily hardwoods with some spruce and comprised trees of sawlog and boltwood size. It includes also about 20 thousand cords of pulpwood.

The current sale is the second large-volume sale made in eastern national forests this fiscal year. A similar volume was sold on White Mountain National Forest, in New Hampshire, earlier in the year.

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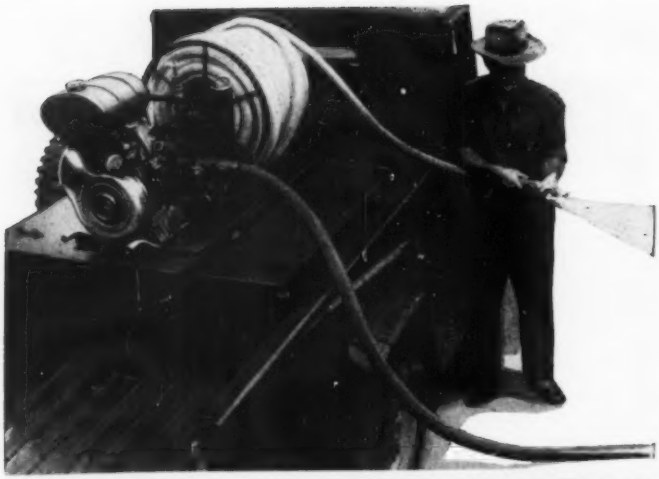

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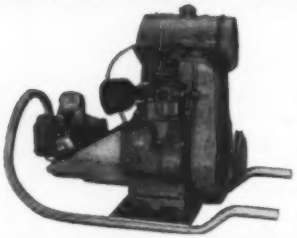

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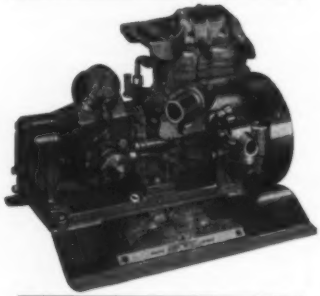

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FIRE EQUIPMENT DIVISION

Northwest Personnel Changes

John L. Emerson of Missoula, Montana, has been named alternate and administrative assistant to Herbert M. Peet, field representative for the Secretary of Agriculture in the Columbia Basin. He replaces Bernard Anderson, who becomes assistant regional forester in charge of personnel for the forest service at the Portland regional office.

Emerson will serve as technical assistant in coordinating the department's programs directed toward the development and conservation of the forest and agricultural resources in the Columbia Basin area. He will review reports and recommendations of bureaus and agencies of other departments, as well as those of the nine agencies of the department, involving agricultural programs within the Pacific Northwest.

He was state director of the Prairie States Forestry Project for Nebraska from 1937 to 1942. From 1942 to 1944, he worked on the Forest Service Emergency Guayule Rubber Project in California. Since 1944, he has been in national forest administration as district ranger, assistant forest supervisor, forest supervisor and regional office staff man in Montana and Idaho. He most recently has been assistant division chief of the division of recreation and lands in the Missoula regional office of the Forest Service.

Anderson has been alternate to Peet at Portland since 1949. He had worked on the Mt. Hood and Fremont national forests in Oregon in 1924, and was with the Bureau of Plant Industry in 1925 to 1927 during the field seasons. From 1928 to 1945, he worked on several forests in Idaho and Montana as staff assistant, assistant forest supervisor, and forest supervisor. He came to Portland from Ogden, Utah, where he was assistant chief of the forest service regional division of operation from 1945 to 1949.

Washington State College Holds Forestry Week

The week of April 8 to 14 was observed as Forest Conservation Week on the State College of Washington campus, Pullman. The observation, sponsored by the Washington State College Forestry Club, is an annual event featuring forestry programs and exhibits which extend beyond the campus itself and reach into the educational institutions throughout the state.

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Wisconsin's Forests

A new 24-page, 4-color booklet *Wisconsin's Forests*, prepared by James N. Fisher, Wisconsin Forestry Advisory Committee, and Arthur W. Jorgenson and Harry G. Allman, Wisconsin Conservation Department, presents the story of forestry in the state.

The material in the booklet has been approved for use by the State Department of Public Instruction. Copies may be obtained from the Information and Education Division, Wisconsin Conservation Department, Madison.

Directors of Forest Experiment Stations Named

Harold L. Mitchell, director of the Central States Forest Experiment Station at Columbus, Ohio, has been appointed director of the Southern Forest Experiment Station at New Orleans. Mr. Mitchell will be succeeded at the Columbus station by Philip A. Briegleb, who has been chief of the Division of Forest Management Research at the Pacific Northwest Forest Experiment Station, Portland, Oreg.

Mr. Mitchell has served as director of the Central States Station since April 1946.

Prior to his work at Columbus he was head of the Lake City, Fla. branch of the Southern Forest Experiment Station. He began his Forest Service career at the Lake States Forest Experiment Station in St. Paul, Minn., immediately after he was graduated from the University of Minnesota School of Forestry in 1930. Later he did two years of graduate work in forestry at Harvard University, where he received a Master of Forestry degree.

In 1934 Mr. Mitchell was appointed assistant director of the Black Rock Forest, a private research laboratory at Cornwall-on-Hudson, N. Y., where he carried on important studies in tree nutrition, soils, and forest management. In 1939 he re-entered the Forest Service and was assigned to flood control survey work with the Northeastern Forest Experiment Station in Upper Darby, Pa. He was transferred to the Lake City, Fla., station in 1941 and remained there until 1946.

Mr. Briegleb, the new director of the Central State Forest Experiment Station, attended the New York State College of Forestry at Syracuse, receiving a B. S. degree in forestry in 1929 and a Master of Forestry degree in 1930.

Following his graduation Mr. Briegleb began work with the Forest Service at the Pacific Northwest Forest Experiment Station.

During 1944 he spent six months making a survey of Chilean forest resources.

From November 1944 to May 1946 Mr. Briegleb was attached to the Northeastern Forest Experiment Station in Upper Darby, Pa.

Fred Stell Enters Private Business

Fred Stell, assistant supervisor, Bitterroot National Forest, Montana, has resigned to engage in private business at Arvada, Colorado.

Stell entered the Forest Service in Colorado in 1913 as a laborer, and later became ranger and assistant supervisor on the White River, Pike, Montezuma, Cochetopa, and Big Horn national forests. During the days of the Plains Shelterbelt Project he served as unit director in Kansas and North Dakota. From 1935 to 1943 he was assigned to the Washington, D. C. office of the Forest Service, successively as inspector of state and private forestry camps of the Civilian Conservation Corps, general inspector of CCC activities, and in the Forest Service Branch of Operation. In 1943 he became assistant supervisor of the Bitterroot forest, which position he held until his resignation on May 31 of this year.

The Forests of Western Kentucky

A small booklet published by the Forest Resources Committee, West Kentucky Development Association, presents in pictorial and chart form the results of a survey conducted by the U. S. Forest Service, Tennessee Valley Authority, Kentucky Division of Forestry, and Kentucky Agricultural Extension Service. The booklet, *The Forests of Western Kentucky*, is printed by TVA and suggests a broad program of resource development.

Texas Association Cuts Dues, Issues Regular Publication

The Texas Forestry Association in March launched a bi-monthly publication, *The News Letter*. It will be published each two months, alternating with the *Texas Forest News* which is published by the Texas Forest Service.

At the same time, the association reduced its annual membership dues to a $2 fee for regular membership. Additional dues classifications are $5, $10, and $25. Purpose of the reduction is to increase the membership base.

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Specialists Needed Abroad

Six hundred agricultural specialists are needed to represent this country abroad in technical cooperation programs, including the Point Four program, under present plans of expansion, according to the U. S. Department of Agriculture.

The department is developing a national roster of professional agriculturists to be used by the department, and other federal and public international organizations, in recruiting personnel for foreign assignments. Qualified specialists are urged to apply for these positions.

The program requires employees with professional academic training and several years of responsible professional experience in the field of agriculture. Applicants must be skilled in their professions, have leadership ability and maturity of judgment, and generally be capable of filling the role of agricultural statesmen.

Areas into which agricultural specialists will be sent include Europe, Latin America, Africa, the Near East, and the Far East.

Research and extension are the principal categories of work in agricultural aspects of technical cooperation. The greatest need is for individuals trained in research or extension phases of soils, forestry, crops, animal husbandry, pest and disease control, agricultural engineering, economics and marketing, and social sciences.

Appointments are exempt from Civil Service examinations. Pay rates range from $5,370 to $10,330 a year. Candidates preferably should be from 30 to 60 years old. Applicants over 60 may be considered for some assignments. Travel expenses to foreign posts for the specialist and dependents will be paid by the government. Employees also may receive quarters and living allowances, special Foreign Service health and leave benefits, and in some cases post differentials of from 10 to 25 percent.

Qualified persons are asked to write to the U. S. Department of Agriculture, Office of Personnel, Washington 25, D. C.

Forest Survey of Eastern Tennessee

After more than 150 years of settlement and development, eastern Tennessee is still almost six-tenths forested, a newly completed forest survey of the region shows.

Results of the survey were released by State Forester J. O. Hazard and Chas. A. Connaughton, director of the Southern Forest Experiment Station, New Orleans. The station made the survey in cooperation with the Tennessee Division of Forestry and the Tennessee Valley Authority. Survey findings on the western half of the state were released last year.

Total commercial forest acreage in the eastern part of the state is 6,114,200 acres. Eighty-five percent of this forest is in private ownership. The largest public landholding is in national forest. Next come the state forests and then the TVA lands. The Great Smoky Mountains National Park, reserved from timber use, was not included in the survey.

About two-thirds of all the forest is stocked with enough trees to take good advantage of the growing capacity of the soil. Many of the trees are still too small and too poor in quality to be of commercial use, however, and the volume in sawlog trees is less than it should be under good forest management. The equivalent of about one forest acre in five is wasted because it is occupied by culls.

A comprehensive report on the forests of the entire state will be issued in the next six months.

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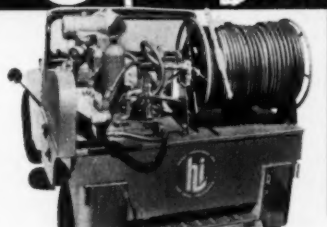

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LUMBERMEN AND FORESTERS are "tied" to Keep Washington Green program of forest fire prevention. Left, Emmit Aston, of Biles-Coleman Lumber Company, Omak, and, right, L. G. Olson, manager White River Branch Weyerhaeuser Timber Company, compare their new hand-painted "Keep Washington Green" neckties with Washington State Forester Bernard Orell's. A dozen of the custom-made neckties were presented to officials of the organization at the recent Governor's Annual Keep Washington Green Meeting, by Juanita R. Gallaher, Editor and Publisher of the *Western States Reclamation Journal*. The ties were presented as a symbol of the cooperation of all interests and agencies in forestry progress—all are "tied" together in a common cause.

When is a Forester Not a Forester?

In the *Oregon Journal*, Lamar Newkirk, columnist, reports on the growth of the Independent Order of Foresters, and is quick to point out that it is a fraternal order started by the keepers of the royal forest in 12th Century England and has "nothing to do with professional foresters."

W. D. Hagenstein, forest engineer for the Forest Conservation Committee of Pacific Northwest Forest Industries, and an associate editor of the JOURNAL OF FORESTRY, points out that Mr. Newkirk is a newsman with considerable interest and knowledge in forestry. He urges other professional foresters to assist local newsmen in keeping the public informed on forestry and professional foresters.

Pulpwood Industry Forestry Camps

As part of a southwide program sponsored by the Southern Pulpwood Conservation Association and financed by the pulpmills, approximately 750 farm boys will be given a week's camping experience and a chance to learn a few of the fundamentals of forestry this summer.

This program is in its seventh year of operation; during this period over 4,000 boys will have been the guests of the pulpmills at camps operated by the state forestry departments in nine of the southern states. The mills contribute from $10,000 to $12,000 annually to the project.

The Vocational Agriculture Department or the Extension Service, or both, in each state choose the boys who are to attend the camps.

Our Public Lands, New Magazine

The first issue of *Our Public Lands*, official periodical of the Bureau of Land Management, appeared in April. The new periodical is a quarterly, semi-technical in nature, featuring articles, pictures, and short items on the objectives and methods of public land management.

Declaring in the lead editorial that "our natural wealth, a major element of United States strength, must be carefully managed, utilized, and conserved," Secretary of the Interior, Oscar L. Chapman emphasized the need for "better coordination of the policies and objectives of community, State, and Federal administrators of the Nation's resources."

"If our land is to be used intelligently," the Secretary said in the editorial, "those who use and manage it must not only understand and accept their great responsibility; there must also be a means for acquainting them with the ideas, techniques and procedures found useful by their fellows. To accomplish this is the purpose of *Our Public Lands*."

Featured in the first issue of *Our Public Lands* are such articles as "Public Lands Today" by BLM Director Marion Clawson, "The Needs and Opportunities in the Conservation of the Public Range," "Land Office Boom in Oil-Shale Patents," "Halogeton: Recognize it, Fight it," "Resource Management Seminar . . . Squaw Butte: 1951," "One Year of Microfilming," "United States Checkerboard"—an article on cadastral surveying—and numerous other shorter items.

Copies may be obtained from The Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 15 cents a copy or 60 cents a year.

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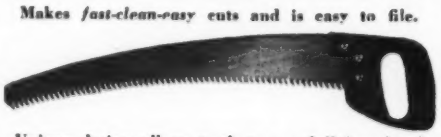

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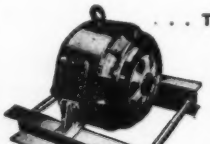

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Nature Sanctuaries

The winter 1950-51 number of *The Living Wilderness*, publication of the Wilderness Society, presents a preliminary inventory of nature sanctuaries in the United States and Canada. The inventory is the result of 12 years of work by the Nature Conservancy's committee on the study of plant and animal communities and the assistance of some 200 or more cooperators. It is an attempt at (1) a compilation of all worthwhile nature sanctuaries in North America, (2) a succinct description of them, and (3) a scientific evaluation.

Ecologists and naturalists are urged to study the inventory and report additional information to the chairman of the committee, S. Charles Kendeigh of the University of Chicago. Copies of the inventory are available from the Wilderness Society, 1840 Mintwood Place, N.W., Washington 9, D. C.

Canadian Foresters To Meet in October

The Forty-third Annual Meeting of the Canadian Institute of Forestry (Canadian Society of Forest Engineers) will be held October 11, 12, and 13 at Banff, Alberta. Theme of the meeting will be multiple use of forest areas.

Members of the Society of American Foresters are cordially invited to attend the sessions and to participate in an elk barbecue on Mount Norquay, a tour of the Calgary Power Company's forestry developments, the annual banquet, and an excursion to Lake Louise and the Valley of the Ten Peaks. Further details of the meeting are available from G. R. Hopping, chairman, steering committee, Forest Insect Laboratory, Customs Building, Calgary, Alberta, Canada.

Photo by John White, Hattiesburg *American*.

JOHNNY PINETREE ON THE AIR. . . . . Pictured above is the cast of one of the Johnny Pinetree Series, *Your Mississippi*, being written and produced by John Guthrie, forester with the Illinois Central Railroad as a public service in cooperation with Radio Station W.H.S.Y., in Hattiesburg, Miss. From left to right are: Jerry Williams, W.H.S.Y. announcer; Joe Zary, ranger, Leaf River District, DeSoto National Forest; Mrs. John Guthrie; and John Guthrie. Mrs. Guthrie plays the part of Kate, the cruising stick, and Mr. Guthrie plays Johnny Pinetree.

National Forest Timber Harvest Increases

The timber cut on national forests was 50 percent greater during the first three months of 1951 than during the same period a year ago. For the three-month period ending March 31 the cut was 634,671,000 board feet as compared with 419,209,000 board feet for the same period last year.

Ira J. Mason, chief of the division of timber management of the U. S. Forest Service, expects the total timber cut for fiscal year 1951 to pass 4 billion board feet. The total cut for the first three quarters of fiscal year 1951 is 3,528,871,000 board feet.

Mr. Mason emphasized the demand for national forest timber resulting from the increased use of forest products for defense and because the national forests offer some of the best timber in the country. National forest timber sales show no slackening off generally, which means that the cut should continue high next fiscal year.

Mr. Mason estimates that timber contractors cut 525,104,000 board feet of national forest sawtimber and 160,190 cords of pulpwood during the quarter ending March 31. The remaining cut was in other forest products such as veneer logs, poles, and mine props.

Leading in timber cut for the quarter was Region 6, made up of Washington and Oregon, with a cut of 284,922,000 board feet. Region 8, which contains the 11 states south of Virginia, was second with a cut of 89,953,000 board feet. Region 9, made up of Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, and North Dakota, was third with a cut of 79,805,000 board feet.

Value of the timber cut during the first three-quarters of fiscal year 1951 is $34,283,091. This is more than the $33,594,614 collected from timber sales and use permits on national forests during the entire fiscal year of 1950.

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Positions Wanted

Forester, Penn State graduate, age 28, married, 2 children, desires permanent position in forest management or utilization fields. Seven years' experience U. S. Soil Conservation Service, farm forestry, management, portable sawmill, chain saw, and wood chipper, planting, and soil conservation practices. Member SAF. References and detailed information on request.
Robert A. Schrack, 1704 Main St., W. Warwick, R. I.

Forestry graduate, 33 years old, married; 9 years in woodland management, timber sales, and administration; experience in sawmilling and logging operations; 4 years research in thinning young pine plantations and natural stands for post and pulpwood. Best of references.
Box V, Journal of Forestry, Mills Building, Washington, D. C.

Graduate forester, 25, B.S.F., desires permanent position with forest-owning or wood utilizing firm in the Northeast. Interest in research or technology. Has good technical background. Detailed information on request.
Box W, Journal of Forestry, Mills Building, Washington 6, D. C.

David Graham, Chairman Conservation Committee

David Graham, vice-president Weyerhaeuser Timber Company, has been appointed chairman of the Committee on Conservation of Renewable Natural Resources, National Association of Manufacturers.

The committee, composed of 100 industrialists studies proposals affecting water, soil, and timber resources and develops programs of education in conservation in cooperation with other organizations.

Green Harvest

The latest in bulletins designed to assist pulpwood producers in their forest management and operating practices is a 55-page booklet, *Green Harvest*, being distributed by Brown Paper Co., Berlin, N. H.

In addition, the company is providing free planting stock for pulpwood producers, and is making its foresters available for marking timber for cutting.

Silviculturist Honored

Leo A. Isaac, silviculturist in the division of timber management research, Pacific Northwest Forest and Range Experiment Station has been awarded the University of Minnesota's Outstanding Achievement Award. The award is given to graduates of the university who have attained high eminence and distinction in their fields.

An authority on forest management in the Douglas-fir region of the Pacific Northwest, Isaac has worked as a Forest Service researcher in that region since 1924.

In 1946, he received the Agnes Healey Anderson forest research fellowship at the University of Washington in recognition of his work with Douglas-fir.

Ravenscroft Leaves Extension For Private Forestry Work

Vernon F. Ravenscroft, Idaho extension forester since 1943, has resigned to become general manager, of a new post treating plant at Tuttle, Idaho. In addition he will perform forestry consulting work in the southwestern Idaho area. Joining Ravenscroft in the new venture is E. L. Williams, instructor in forestry at the University of Idaho.

Ravenscroft has been a pioneer in the field of post treatment by the cold-soak bath method utilizing pentachlorophenol. His new plant has a planned capacity of 100,000 posts for the first year, and will be Idaho's largest fence post treating operation.

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Forest Service Men Get Awards

Christopher M. Granger and Earl W. Loveridge, assistant chiefs of the U. S. Forest Service, received Department of Agriculture distinguished service awards from Secretary Charles F. Brannan at ceremonies on the Washington Monument Grounds May 15. The award is the highest given by the department to its employees.

In the citation Secretary Brannan commended Mr. Granger for his dynamic leadership in administering national forest activities. Since 1935, when Mr. Granger was appointed assistant chief in charge of the branch of national forest administration, the timber cut on national forests has increased from less than a billion board feet to more than four billion board feet a year; recreational use of national forests has increased 60 percent; total mileage of national forest roads has increased 38,000; and total receipts from national forests have increased ten times.

Mr. Loveridge, assistant chief in charge of the branch of administrative management and information, was commended for his contributions to scientific management and for the development of a comprehensive inspection system. His efforts have resulted in more effective use of Forest Service manpower, material, and equipment. Mr. Loveridge is the author of *Job Load Analysis in Planning of Executive Work in National Forest Administration*, published in 1932

Lake State Foresters, Entomologists Plan Work

On April 24 a group of foresters and entomologists representing Michigan, Wisconsin, and Minnesota met at Madison, Wis. to discuss the various forest insect and disease survey methods being used in the Lake States, and to outline plans for some uniformity of reporting for the region.

The meeting was called by the U. S. Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory in Milwaukee. The bureau is cooperating with state and federal agencies in these states on forest insect investigations. Uniformity in reporting, at least in some degree, by state and federal agencies will serve in constructing the over-all insect and disease picture for the area, and aid materially in coordinating control programs.

Represented at the meeting, in addition to the bureau, were the universities of Minnesota, Wisconsin, and Michigan, and Michigan State College; the conservation departments of Minnesota, Wisconsin, and Michigan; the U. S. Forest Service regional office; and the state entomologists of Minnesota and Wisconsin.

Plans were made for a summer field meeting in July, and for another meeting late in the winter to go over the current year's work done by each agency, to correlate the results, and to take further steps toward uniformity of surveys and reports.

Place Mats for Fire Prevention

Restaurant paper place mats featuring Wisconsin's northland and warning against the hazards of forest fires are being offered to northern Wisconsin eating establishments this year. The mats are made by the Daniels Manufacturing Co., Rhinelander, on a design laid out by the conservation department. They are being distributed by the Paper Specialty Co. of Wausau.

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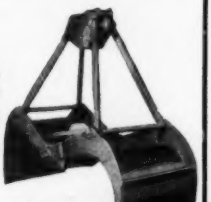

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Hardwood Rules Book In New, Large Format

The National Hardwood Lumber Association, Chicago, announces the issuance of a new, enlarged illustrated edition of the association's Grading Rules Book.

Known officially as *Rules for the Measurement and Inspection of Hardwood Lumber, Cypress, Veneers and Thin Lumber*, the rules book has served for many years as the text book of hardwood buying and selling.

The new edition, containing 80 pages, is large in size, 8½ x 11 inches, and is printed in two colors throughout. In addition to containing all the current rules and the sales code of the association, the book is illustrated with pictures of all the principal hardwood species together with a summary of their uses, range and working properties. Line drawings of the leaves and fruit of the species provide additional identification data as well as adding a fitting decorative motif.

A considerable amount of reference material, a list of lumber associations providing grading rules, list of trade papers, shipping information, and sources of data on specific uses of a wide variety of woods rounds out the book to the point that it will be found a valuable addition to lumber literature. A limited number of copies is available at the less-than-cost price of $1.00 each from the National Hardwood Lumber Association, 59 E. Van Buren Street, Chicago, Ill.

Camp Named Economics Chief

Harry W. Camp, Jr. has been appointed chief of the division of forest economics at the Northern Rocky Mountain Forest and Range Experiment Station, Missoula, Mont. He succeeds M. B. Dickerman, now director of the experiment station at St. Paul, Minn. Camp has been in charge of the forest survey program in the northeastern states.

A graduate of the University of California, he worked as timber cruiser, forest ranger, and in numerous other capacities on several California national forests from 1933 to 1944. Since the latter date, he has been in forest survey work in California and in the northeastern states.

The work of the forest economics division, to be directed by Mr. Camp, will include a resurvey of the timber resources of Montana, Idaho, and northeastern Washington. Mr. Camp will also study the possibility for development of a pulp and paper industry in Montana.

Dogwood Diseases

A disease attacking both pink and white flowering dogwood has been definitely identified in the Columbia, S. C. area, according to State Forester C. H. Flory. The spot anthracnose disease, caused by the fungus *Elsinoe corni* was first observed in 1948 at Savannah, Ga. Since then the disease has attacked dogwoods in Florida, South Carolina, North Carolina, Virginia, West Virginia, Maryland, and Delaware.

The spot fungus damages dogwood leaves, stems, flowers, and fruits, greatly detracting from the beauty of the dogwood, but so far no trees have been reported killed by the disease.

Control measures recommended include spraying early in the season with Bordeaux mixture, then later or at weekly intervals with equal parts of Fermate and Deenate.

The U. S. Bureau of Plant Industry has invited the public to send specimens of branches, leaves, fruit, or blossoms of dogwood affected by spot anthracnose or other diseases to its laboratory at Beltsville, Md.

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